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RESPONSE TO USEPA AND OHIO EPA COMMENTS OU2 DRAFT FEASIBLITY STUDY REPORT

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RESPONSE TO USEPA AND OHIO EPA COMMENTS OU2 DRAFT FEASIBILITY STUDY REPORT

RNALD ENVIRONMENTAL MANAGEMENT PROJECT FERNALD, OHIO

MEDIAL INVESTIGATION AND FEASIBILITY STUDY

5855

V-004-1108.

AUGUST 1994

U.S. DEPARTMENT OF ENERGY
FERNALD FIELD OFFICE

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RESPONSE TO USEPA AND

OHIO EPA COMMENTS

OU2 DRAFT

FEASIBILITY STUDY REPORT

INTRODUCTION

The Operable Unit 2 (OU2) Feasibility Study Report (FS) was submitted to the EPA on April 29, 1994. Initial meetings to discuss the FS were held between EPA, OEPA, and DOE on May 16 and June 13, 1994. A public workshop on the FS was held on June 28, 1994. EPA comments on the document were received on July 5, 1994; OEPA comments had been received prior to that date. Draft responses were developed, and those responses were discussed with EPA and OEPA in Chicago on July 22, 1994. The attached responses and the revised FS address the EPA and OEPA comments, and do so with an approach to the major issues that was agreed to at the various meetings.

The general comments from the EPA and OEPA necessitated significant restructuring of the Operable Unit 2 Feasibility Study. The major issues that caused restructuring of the document can be summarized as follows:

- USEPA General Comment #1 strongly requested OU2-wide alternatives rather than subunit-specific alternatives. The revisions to effect this change resulted in the restructuring of Sections 4, 5, and 6, and major revision of Section 3, the Executive Summary, and the Proposed Plan.

- The implementability of an on-site disposal facility, in comparison to consolidation and capping, was enhanced by the following three factors:

  - Development of the internal draft of the Operable Unit 5 FS indicated a potential need for on-site disposal, which made coordination of a site-wide facility possible.
  - Public meetings and the Fernald Citizens Task Force indicated an interest in flexible land-use options. Land-use flexibility is maximized by reducing the number and area of locations that would contain capped wastes.
  - EPA has indicated a willingness to consider a waiver of OEPA's solid waste landfill siting criteria.

  These points improved the implementability of alternatives utilizing on-site disposal. The ultimate result of the progression of the CERCLA process was that on-site disposal (rather than consolidation and capping) is presented as the preferred alternative in the Proposed Plan.

As a consequence of the restructuring of the document, and as agreed upon with EPA and OEPA during the July 22 meeting, this response document does not follow the format typical of other response documents produced at the Fernald Environmental Management Project (FEMP). This submittal of the FS has been revised extensively and it is not possible to note each specific change; rather, reviewers will need to examine both the summary of changes and the revised section. As a result of deletions during the revision, many of the comments pertain to text that no longer exists.

This response document is organized into three major sections. The first is a summary of the changes in each section of the document. The second section consists of responses to U.S. EPA comments. The final section consists of responses to OEPA comments.

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SUMMARY OF CHANGES

The significant modifications to each of the FS sections are noted below on a section-by-section basis. There were other editorial modifications as well, both related to these revisions and to formatting/grammar/spelling corrections to the original text; however, editorial modifications have not been highlighted in this summary.

Executive Summary

The Executive Summary was revised to address the alternatives on an operable unit-wide basis rather than by specific subunits. Also, the text was simplified for clarity by doing the following:

- Revising the introductory text and deleting the associated figure.
- Deleting detailed descriptions of the subunits.
- Deleting the detailed discussion of the Baseline Risk Assessment and associated tables.
- Adding more detail to the discussion of PRLs.
- Using a table to present RAOs.
- Revising the discussion of comparison of alternatives (including deletion of the related figure) and limiting that discussion to text rather than tables.
- Using a simplified table to present the comparative costs of target risks and land uses.

Section 1.0

The primary changes to Section 1.0 related to the summary of the OU2 RI Report. The OU2 RI Report was resubmitted to address comments from EPA and OEPA, and the results of the nature and extent of contamination, fate and transport modeling, and Baseline Risk Assessment were modified. The changes to Section 1.0 of the OU2 FS reflect these changes to the OU2 RI Report.

Section 2.0

The following changes have been made to Section 2.0:

- Addition of a summary and discussion of COCs from the updated Baseline Risk Assessment.
- Addition of a discussion on the EPA waiver for the OEPA siting criteria.
- Deletion of the OEPA exempt waste classification and associated ARARs.
- Discussion of the mixed waste and low-level radioactive waste classifications of the firing range material.

- Updated the risk-based PRGs based on modifications made in the Operable Unit 2 Baseline Risk Assessment.
- Enhanced the cross-media PRGs section to include surface water and radon (for completeness only).
- Updated the cross-media groundwater and perched water PRG tables based on modeling modifications identified in Appendix D.
- Provided a summary section that contains the PRLs for private ownership and federal ownership with and without source controls.
- Changed the definition of PRLs to be PRG plus background for radionuclides and equal to the PRGs for organic and inorganic chemicals.
- Provided a table with Operable Unit 2 specific remedial action objectives (RAOs) to replace individual subunit RAOs.

Section 3.0

The following changes have been made to Section 3.0:

- The title of Section 3.0 has been changed to "General Response Actions and Identification/Screening of Remedial Action Technologies and Process Options."
- A clarification of the purpose of Section 3.0 has been added to Section 3.1.
- The volumes of contamination have been recalculated, therefore, all the values of estimated volumes in Section 3.2 have been revised and updated. The format of Tables 3-1 through 3-5 has been updated and improved. To clarify the presentation of volume estimates, detailed discussions of the PRLs used for calculation of remediation volumes have been omitted and reference made to Section 2.0. The discussion of cross-contaminated flyash volumes has been omitted because it is no longer relevant to the volume calculations.
- Miscellaneous text revisions were made in Section 3.3, but no major rewording.
- Section 3.4 was retitled to properly reflect the inclusion of descriptions of technologies and process options in the tables. There was rewording of discussions presented under the "Comments" heading in Tables 3-6 through 3-10. The revised text provides expanded discussions of effectiveness and implementability with regards to specific site conditions.
- Section 3.5 received major format changes; descriptions and evaluations of potentially applicable process options, previously presented in separate subsections on a subunit basis, were presented together organized on a site-wide basis by medium. This information was previously presented in Sections 3.5 through 3.8.
- The listings of potentially applicable process options in Section 3.6 are now presented in tabular form.

Section 4.0

Five major changes were made to Section 4.0 to simplify it and improve readability:

- The alternatives were developed and screened on an Operable Unit 2 basis, rather than on a subunit basis.
- Representative DOE and commercial off-site disposal facilities were evaluated. The representative commercial off-site disposal facility was identified for detailed analysis due to lower costs.
- The alternatives were screened and compared assuming federal ownership with access controls. Significant differences between the private ownership and federal ownership scenarios have been noted.
- A new subsection has been added (Section 4.2.4) which describes factors common to several, or all, remedial alternatives. This avoids considerable repetition as well as eliminating those factors which do not differentiate between alternatives during the screening process.
- A new table (Table 4-4) has been added which summarizes the results of the alternative screening process.

Section 5.0

Three major changes were made to Section 5.0 to reduce its size and simplify it:

- The detailed analysis of alternatives was performed for OU2 as a whole, instead of for each subunit.
- The alternatives were analyzed assuming federal ownership with access controls.
- Significant differences within an alternative that would be associated with private ownership have been noted in a new subsection at the end of the analysis of each alternative.

Section 6.0

The changes made in Section 5.0 have been carried through into Section 6.0, which shortens the section considerably and makes it more understandable.

Appendix A

The following changes have been made to the content of Appendix A as a result of changes in the list of COCs from the OU2 RI Report:

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- The COCs that appear in Tables A.1-1 through A.1-5, and throughout Appendix A, have been updated to agree with the OU2 RI Report.

- Solid Waste Landfill:

  - antimony, strontium-90, and benzo(a)anthracene have been added
  - cesium-137, chromium, and 4,4-DDE have been deleted

- Lime Sludge Ponds

  - strontium-90 has been added
  - Aroclor-1254, benzo(a)pyrene, benzo(b)fluoranthene, beryllium, chromium, dibenzo(a,h)anthracene, indeno(1,2,3-cd)pyrene, and 4,4-DDE have been deleted

- Inactive Flyash Pile

  - beryllium and cesium-137 have been deleted

- South Field

  - strontium-90 has been added
  - chromium and chrysene have been deleted

- Active Flyash Pile

  - cesium-137 and strontium-90 have been added

The filtered/unfiltered status of several perched groundwater samples has been changed from "unknown" to either "filtered" or "unfiltered". This update allows these samples to be used in the statistical analysis presented in Appendix A. To incorporate this updated data, the detailed sample results tables have been updated, and the corresponding perched groundwater statistics have been re-analyzed.

Section A.1.3 has been added to provide additional clarification of the data tables and figures. In particular, the variability in reported detection limits has been addressed, as well as the interpretation of cumulative percentile statistics in the detailed results figures.

Appendix B

Two significant changes were made in Appendix B:

- The OEPA Exempt Waste Disposal Regulations were deleted from Tables B-1, B-2, and B-5 based on comments from OEPA (General Comment #2).

- Since Operable Unit 2 is now seeking an EPA waiver of the sole-source and high-yield aquifer siting criteria, OEPA guidances that discussed obtaining an exemption from siting criteria were deleted from Table B-5.

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Other changes included:

- The MCL and Water Quality Standard lists were updated in Table B-1 to include all COCs identified in the final RI Report.
- ORC 3734.02(A) was identified as an ARAR to support the basis of the EPA waiver.
- The RCRA CAMU ARAR remarks in Table B-2 were modified. It is noted that current Operable Unit 2 alternatives plan to dispose of the firing range mixed waste at an off-site facility; however, if Operable Unit 5 puts hazardous waste in a centralized disposal facility together with Operable Unit 2 wastes, it will become more cost-effective to also dispose the firing range waste in the centralized facility. The CAMU rule will only become necessary in that event. The remark also notes that the RCRA disposal requirements will be addressed in the Operable Unit 5 ARARs.
- The information on site endangered and threatened species in Table B-5 was updated with the latest available data.

Appendix C

As a result of comments, the following was incorporated into the FS risk assessment to estimate remedial action risks and residual risks:

- A nonremediation worker was added to evaluate the potential risk to on-property administrative workers.
- Chronic RfDs were used rather than subchronic RfDs due to their conservatism. In addition, a remediation worker may work on the site for more than seven years. This is in line with the Operable Unit 1 and Operable Unit 4 risk assessments.
- The assumption that a remediation worker is fully protected by personnel protective equipment (as stated in the RAWPA) was not used. Rather, for a more conservative approach, it was assumed that the remediation is impacted through the inhalation pathway.
- The most current IRIS (July 1994) and HEAST (1994) toxicity values were incorporated.
- A summary of the Baseline Risk Assessment from the June 1994 Operable Unit 2 RI was incorporated.
- PRGs were used to calculate the risk for COCs.
- For calculating the risk from beryllium, 100 percent gastrointestinal absorption was used (as per U.S. EPA Region V guidance).
- An analysis for the food pathways (meat, milk, vegetables, and fruit) was incorporated into the residual risk evaluation.
- The uncertainties analysis was substantially revised to bracket upper- and lower-bound risk.

Appendix D

Appendix D was revised as follows:

- To avoid confusion, the discussion of ECTran, used for screening, was removed. Additional ODAST/SWIFT modeling runs were performed to allow the ECTran discussion to be deleted.

- Input parameters to ODAST were modified based on EPA comments; a uranium K_d of 23 was used for the OU2 subunits. The Solid Waste Landfill and Lime Sludge Ponds were modeled based on the potential effect of the change in uranium K_d.

- To take into account the uncertainty of the lysimeter data, a uranium K_d of 3.7 was used in the development of the waste acceptance criteria for the on-site disposal cell. The K_d of 3.7 in the ODAST model will predict the lysimeter results.

- Section D.5 was added to show the development of the PRGs.

- Risk-based PRGs were updated to reflect changes in the revised OU2 RI Baseline Risk Assessment.

Appendix E

The following changes have been made to the sections of Appendix E:

- Appendix E.1, Remediation and Excavation Volumes, replaces Appendix E.4. Appendix E.1 contains remediation and excavation volume calculations for the five OU2 subunits. These have been developed based on a block model analysis for radium-228, thorium-228, and uranium-238 and estimated excavation limits. Other COCs present at levels above their respective PRLs have been assessed to determine if they contribute additional remediation volume.

- Appendix E.2, Waste Acceptance Criteria, is a new appendix that replaces the Appendix E.2 from the previous submittal. It includes waste acceptance criteria for a commercial off-site disposal facility (Envirocare) and for a conceptual on-site disposal facility. Uranium-238 activity calculations (formerly Appendix E.2) have been incorporated into Appendix D.

- Appendix E.3, Operable Unit 2 On-Site Disposal Cell, replaces Appendix E.6 from the previous submittal. The following additional information is included in Appendix E.3:

  - siting criteria
  - supplemental geotechnical data
  - revised volume calculations for sizing of cell
  - conceptual cap and liner detail
  - waste placement requirements
  - preliminary waste acceptance criteria discussion

- Infiltration calculations (formerly Appendix E.3) have been included in Appendix D, except for infiltration calculations pertinent to the on-site disposal cell, which are included in Appendix E.5.

- Appendix E.4, Perched Groundwater Collection and Control, replaces Appendix E.5. The only change to this appendix is that the interceptor trench was renamed to the subsurface drain.

- Appendix E.5, Infiltration Calculations, is a new appendix not included in the previous submittal. This appendix provides infiltration calculations for the disposal cell cap, liner, and berm.

- Appendix E.6, Typical Sections and Details, replaces Appendix E.1. The typical section for the clay cap is no longer applicable and therefore was deleted.

Appendix F

Appendix F.1, Basis of Cost Estimate, was revised as follows:

- The bases of cost estimate are presented for the following alternatives:
  - Alternative 2 - Consolidation and Capping, Federal Ownership (referred as "expanded trespasser" in cost estimates) land-use scenario
  - Alternative 3 - Excavation and Off-Site Disposal, Private Ownership (referred as "resident farmer" in cost estimates) and Federal Ownership land-use scenarios
  - Alternative 5 - Excavation and On-Site Disposal, Federal Ownership land-use scenario
  - Alternative 6 - Excavation and On-Site Disposal with Off-Site Disposal of Fraction Exceeding the Waste Acceptance Criteria, Private Ownership and Federal Ownership land-use scenarios

- Included criteria for estimating volume of additional excavation quantities and swell, density, and shrinkage factors

- Added scope of work for on-site disposal cell

- Added cost estimate for Alternative 5 - Excavation and on-site disposal as a base cost estimate for screening costs for Alternative 6, 7, and 8

- Deleted present worth analysis for alternatives included in previous submittal of the Feasibility Study and added present worth analysis for the revised Alternatives 2, 3, 5, and 6

- Added cost estimate Appendix C - Health Physics

- Added Construction Activity Duration Schedule for Operable Unit 2 alternatives.

- Revised Appendix E to include basis of cost estimate for a representative off-site disposal facility (Envirocare)

- Added basis of estimate for the construction duration

Appendix F.2, Off-Site Disposal - Cost Comparison NTS vs. Envirocare, is new and replaces the old Appendix F.2 included in April 1994 submittal of the Feasibility Study.

Appendix F.3, Screening Alternatives Comparison of Estimated Costs, is new and replaces Appendix F.3 included in April 1994 submittal of the Feasibility Study.

Appendices F.4 through F.7, Detailed Cost Estimates, are revised detailed cost estimates which replace Appendices F.2 through F.6 included in the April 1994 submittal of the Feasibility Study.

Appendix F.8, Cost Comparison of 10^{-5} and 10^{-6} Risk Criteria, is new and presents net present worth costs for 10^{-5} and 10^{-6} risk criteria for the alternatives selected in Section 5 - Detailed Analysis of Alternatives.

Appendix G

Minor revisions to Appendix G (i.e., Cumulative Impact Analysis) were completed as a result of the revised representative alternative for Operable Unit 2. Environmental impacts related to the implementation of the representative alternative (as discussed in sections 2 and 3) were updated appropriately.

Appendix H

Appendix H (i.e., Wetland and Floodplain Assessment) was amended to exhibit the following FS document revisions: (1) deletion of the subunit concept (and subsequently subunit-specific alternatives) and (2) change in the representative alternative. As a result of the deletion of subunits, the format of Appendix H was also revised. The change in representative alternative resulted in additional minor wetland impacts.

Appendix I

The following revisions were made to the CRARE for this FS submittal:

- Updated information from the Operable Unit 2 RI Baseline Risk Assessment and the Operable Unit 1 FS Risk Assessment were incorporated.
- GMR user (agricultural, residential, recreational) receptors were added.
- The latest K_ds were used in groundwater modeling.
- The text for screening COCs was clarified.
- The text for receptor screening was clarified.

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- For beryllium, 100 percent gastrointestinal tract absorption was used as per EPA Region V guidance.
- IRIS (July 1994) and HEAST (1994) were used for RfDs and cancer slope factors.
- The uncertainty analysis was substantially revised to bracket upper-bound and lower-bound risk.

Proposed Plan

The major revisions in the Proposed Plan were made to Section 5, Summary of Alternatives, and Section 6, Evaluation of Alternatives. The changes in these sections were made pursuant to revisions in the Operable Unit 2 Feasibility Study Report. The revisions were made so that the alternatives were no longer divided into subunits, but served Operable Unit 2 in its entirety. As a result of this and a number of factors discussed in the "Introduction," the preferred remedial alternative changed. Language was also included discussing the potential EPA waiver of OEPA siting criteria that needs to be approved by EPA.

RESPONSE TO USEPA COMMENTS

RESPONSE TO USEPA COMMENTS ON THE DRAFT FEASIBILITY STUDY (FS) REPORT AND PROPOSED PLAN (PP) FOR OPERABLE UNIT 2 (OU2)

Commenting Organization: U.S. EPA Commentor: Saric
Section #: NA Page #: NA Line #: NA Code:
Original General Comment: 1

Comment: The FS report evaluates alternatives for each of the five subunits without ever combining subunit alternatives into comprehensive OU2 alternatives. Section 4 describes the development of alternatives for each of the subunits, but the screening step usually described in Section 4 was not conducted. Detailed analysis was then conducted for each alternative for the five subunits. This involved detailed analysis for a total of 29 alternatives. This approach has several major drawbacks:

1. This approach makes it nearly impossible to determine the time and cost impacts of combining the various alternatives for the five subunits. Not being able to evaluate complete OU2 alternatives makes decision making problematic. For instance, it would be helpful to know what the total costs are for implementing on-site disposal for each of the five subunits in order to compare these costs with the total costs for implementing consolidation and containment for each of the five subunits. Evaluation of a combination of on-site disposal and consolidation and containment would also be helpful.

2. This approach ignores the practical aspects of implementing a complete OU2 alternative. There are obvious combinations of subunit alternatives that should be evaluated as well as highly unlikely combinations that should be ignored. For instance, consolidation and containment of the Inactive Flyash Pile would likely occur in combination with consolidation and containment of the South Field and Active Flyash Pile. On the other hand, implementing vitrification and on-site disposal for the South Field only while consolidating and containing the other four subunits would be highly unlikely.

3. This approach has made Section 5 of the FS report overly long and unnecessarily repetitive.

Following are three general options for revising the FS report.

Option 1

Approach - In Section 4, screening of subunit alternatives currently developed could be presented and several alternatives for each subunit could be eliminated, as appropriate. Then, before the detailed analysis, remaining subunit alternatives could be combined into OU2 alternatives. This would require major revisions of Sections 4, 5, and 6 of the FS report, and corresponding revision of the PP. However, this approach would reduce FS report length and repetition.

Impact on Evaluation of Alternatives - Based on the information presented in the FS report, the alternative screening in Section 4 would likely result in elimination of off-site disposal, vitrification of wastes, and treatment of the flyash or lime sludge. The remaining subunit alternatives would then be combined for the detailed analysis, resulting in a list of OU2 alternatives similar to the following:

- No action
- On-site disposal for all subunits
- On-site disposal for all subunits with treatment (stabilization or soil washing) of inactive Flyash Pile and South Field wastes
- Containment and consolidation for all subunits
- Containment and consolidation for the Solid Waste Landfill and Lime Sludge Ponds and on-site disposal of Inactive Flyash Pile, South Field, and Active Flyash Pile wastes

Option 2

Approach - The 29 subunit alternatives could be combined into OU2 alternatives in Section 4 without screening of the subunit alternatives but taking into account practical OU2 management issues. The detailed analysis and comparative analysis would then be conducted on the OU2 alternatives. Section 4 would need to be revised by the addition of a new subsection that combines subunit alternatives into OU2 alternatives and provides detailed explanations of why the particular combinations are the most practical. Section 5 and 6 of the FS report would require major revisions, as would the PP. However, this approach would reduce FS report length and repetition.

Impact on Evaluation of Alternatives - Based on practical OU2 management considerations but ignoring any evaluation currently presented in Section 5, the new subsection in Section 4 would combine the 29 subunit alternatives into a list of OU2 alternatives for detailed analysis. The list of alternatives for detailed analysis would likely be similar to the following:

- No action
- Off-site disposal for all subunits
- On-site disposal for all subunits
- On-site disposal for all subunits with selective vitrification
- On-site disposal for all subunits with selective stabilization
- On-site disposal for all subunits with selective soil washing
- On-site disposal for all subunits with flyash stabilization
- Consolidation and containment for all subunits
- Consolidation and containment for the Solid Waste Landfill and Lime Sludge Ponds and on-site disposal for the Inactive Flyash Pile, South Field, and Active Flyash Pile

Option 3

Approach - Section 5 could present an alternative screening step elimination several alternatives for each of the subunits. The most viable subunit alternatives could then be combined into OU2 alternatives for comparative analysis in Section 6. This option would require the least amount of document revision. However, new subsections would need to be added to Section 5 to provide the rationale for eliminating subunit alternatives and to develop OU2 alternatives, and Section 6 and the PP would need major revisions. Although this option would not necessarily reduce FS report length or repetition, much of the repetition in Section 5 could be avoided by cross referencing.

Impact on Evaluation of Alternatives - The new subsections in Section 5 would eliminate many of the 29 subunit alternatives, resulting in a drastically reduced list from which OU2 alternatives would be assembled. The list of OU2 alternatives for comparative analysis would likely be similar to the following:

- No action
- On-site disposal for all subunits
- Consolidation and containment for all subunits
- Consolidation and containment for the Solid Waste Landfill and Lime Sludge Ponds and on-site disposal for the Inactive Flyash Pile, South Field, and Active Flyash Pile

The methods of perched groundwater and construction water treatment and surface run on and runoff control for OU2 alternatives would remain the same as the methods currently described for similar subunit alternatives.

Response: Presentation of subunit-specific alternatives was believed to be the approach that most closely followed the general EPA guidance on development of feasibility studies. However, it is agreed that the subunit-specific approach does complicate the degree to which cost and implementability may be evaluated on an operable unit-wide basis. The approach also causes Section 5 of the FS to be quite lengthy and repetitive.

To address these issues, portions of the FS will be restructured beginning in Section 4. The planned approach is to take subunit specific process options developed in Section 3 and directly develop Operable Unit 2-wide alternatives. To provide a more direct comparison among the alternatives and to further enhance the readability of the document, the OU2-wide alternatives will be developed for a single land use assumption (Federal Ownership) with sensitivity to alternate land use discussed briefly with each alternative.

Action: Based on this approach, DOE has presented the following alternatives in Section 4:

- Alternative 1 - No action
- Alternative 2 - Consolidation and capping
- Alternative 3 - Excavation and off-site disposal
- Alternative 4 - Excavation and off-site disposal with treatment of fraction exceeding WAC
- Alternative 5 - Excavation and on-site disposal
- Alternative 6 - Excavation and on-site disposal with off-site disposal of fraction exceeding WAC
- Alternative 7 - Excavation and on-site disposal with treatment of fraction exceeding WAC
- Alternative 8 - Excavation and treatment with on-site disposal

where WAC refers to waste acceptance criteria at the disposal facility. These alternatives were screened in Section 4 based on implementability, effectiveness, and cost.

The following alternatives were carried forward to Section 5 for detailed evaluation:

- Alternative 1 - No action
- Alternative 2 - Consolidation and capping
- Alternative 3 - Excavation and off-site disposal
- Alternative 6 - Excavation and on-site disposal with off-site disposal of fraction exceeding WAC

In order to create a consistent OU2-wide approach to replace the earlier subunit-specific approach, major revisions were also made in Section 3, Section 6, the Executive Summary, and the Proposed Plan.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: NA Page #: NA Line #: NA Code:
Original General Comment: 2

Comment: The alternatives for the expanded trespasser and off-site resident farmer scenarios do not appear to consider the depth at which contamination is found in the subunits. It appears that on-site disposal alternatives involve excavation of all materials in excess of preliminary remediation levels (PRL) no matter where in the subunit the contamination is located. This is not appropriate for the Solid Waste Landfill or the Lime Sludge Ponds, which involve only the ingestion, inhalation, and direct contact exposure routes.

Response: In the April FS, the practical aspects of excavating materials above the PRLs in the Solid Waste Landfill accounts for the apparent insensitivity to depth. Due to the built-in costs of mobilizing and demobilizing, even for a small excavation, and the need to excavate with workable slope faces, it is cost effective to excavate material beyond what might be excavated solely due to PRLs and depth. Cost differences are even less of a factor if the alternatives are considered on an OU2-wide basis as they are in the revised FS. Hence, it was considered more practical and somewhat conservative to develop alternatives that propose general excavation without regard to minor gains due to a close consideration of depth of contamination.

In the revised FS, because the materials at the solid waste landfill and lime sludge ponds are being treated as solid waste, they must either be capped in place or excavated for placement in an engineered disposal facility. So in cases for on-site disposal, both the Lime Sludge Ponds and Solid Waste Landfill are excavated at least to the extent that sludge and solid waste are modeled at the units.

Action: Restructuring the subunit-specific alternatives as operable unit-wide alternatives plus consideration of the sludge as solid waste has eliminated this concern.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: NA Page #: NA Line #: NA Code:
Original General Comment: 3

Comment: The FS report evaluates on-site disposal for each of the five subunits. The FS report does not address overall on-site disposal capacity issues that may arise when OU2, OU3, and OU5 are considered together. The FS should discuss whether or not suitable on-site disposal areas exist for the rest of the waste to be dispositioned at the Fernald Environments Management Project (FEMP). The FS report should address this issue in the context of the relative need for more controlled (engineered on-site disposal cell) disposal, taking into consideration such factors as the levels of contamination, current locations of the wastes, current and future risks from the wastes, and technical issues involved in removing, treating, or disposing of the wastes. If OU3 and OU5 present a greater need for a potentially limited on-site disposal capacity, then that fact is germane to the remedy decision for OU2. If suitable on-site disposal areas are available for all wastes from OU2, OU3, and OU5, then that fact should be stated in the FS report.

Response: Agreed.

Action: The OU2 FS has been revised to include additional information concerning on-site disposal that assess the overall volume of material to be generated by OUs 3 and 5 as well as OU2. This is presented in Appendix E.3. That appendix presents a location map of that area on the site which is most geologically suitable for engineered on-site disposal. That area is then compared to a conceptual cell layout that is sufficient to hold the current worst-case volume of materials being considered for on-site disposal by the three Ous. However, the RI/FS schedules of Ous 3 and 5 preclude any definitive presentation on this topic by OU2; it should be noted that information provided in the OU2 FS, while the best available, may differ from the final proposals submitted by OUs 3 and 5.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: NA Page #: NA Line #: NA Code:
Original General Comment: 4

Comment: Detailed volume calculations are presented in Sections 3 and 5 for various subunit alternatives. The volumes presented in different subsections of Sections 3 and 5 are not consistent. In some cases, several different volumes appear to be used for the same waste type. The volumes used for the same waste type should be consistent throughout the FS report.

Response: In the evolution from general response actions to detailed alternatives, the discussion of volumes changes from general PRL-based volumes to specific excavation volumes associated with detailed description of the alternatives. To alleviate this confusion, better definitions of the volume types at each stage of the development process will be provided.

Action: Appendix E.1 has been revised to present excavation volumes along with contamination volumes. The contamination volumes are used in Section 3. The moderately higher excavation volumes are used in Section 5.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: NA Page #: NA Line #: NA Code:
Original General Comment: 5

Comment: For all subunits except the Active Flyash Pile, the FS report proposes alternatives for excavation of contaminated material and disposal either at the Nevada Test Site (NTS) or in an on-site disposal cell. Testing and segregation of the wastes are proposed to determine which wastes need to be sent to NTS or to the on-site disposal cell. The text does not explain what type of disposition is proposed for material that does not need to be taken to NTS or to the on-site disposal cell. This issue should be clarified in the FS report.

Response: The OU2 FS alternatives, as presented in Section 5, include options for sending some materials to commercial solid waste disposal facilities. This is being deleted from the next submittal and all material will either be disposed in an on-site cell or at an off-site facility that can accept radiologically contaminated waste (either NTS or a commercial facility such as EnviroCare). No other off-site disposal facilities are currently being considered.

Action: The screening of disposal technologies in Section 3 has been revised to reflect this concept. Only the off-site facilities mentioned above are carried through the remainder of the FS.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: NA Page #: NA Line #: NA Code:
Original General Comment: 6

Comment: The FS report proposes the designation of a corrective action management unit (CAMU) for on-site disposal of OU2 waste. The text states that the Resource Conservation and Recovery Act (RCRA)CAMU rule is relevant and appropriate to OU2 remediation activities. The CAMU rule is then used as the basis for an assertion that the State of Ohio siting criteria do not apply to the OU2 on-site disposal cell. There are two problems with this assertion.

First, the CAMU rule is deemed relevant and appropriate even though the FS report finds that the hazardous waste regulations in RCRA Subtitle C are neither applicable nor relevant and appropriate. It is not clear how the CAMU rule can be considered relevant and appropriate when RCRA Subtitle C is not. The FS report should explain how the OU2 wastes meet the definition of remediation wastes (see page 2-9, lines 25 through 28 in the FS report) when the report states that the OU2 wastes do not contain listed wastes and are not themselves characteristic. Second, the appropriateness of applying the CAMU rule to OU2 notwithstanding, it is not clear that a CAMU designation supersedes state siting laws and regulations. These technical and legal issues should be resolved among the U.S. Environmental Protection Agency (U.S. EPA), Ohio Environmental Protection Agency (OEPA), and U.S. Department of Energy (U.S. DOE), and the FS report should be revised accordingly.

Response: The CAMU is no longer being considered as relevant and appropriate for on-site disposal non-RCRA wastes. Additionally, although Operable Unit 2 has proposed off-site disposal of hazardous waste in all alternatives, the CAMU may be used for the firing range material if Operable Unit 5 identifies on-site disposal of RCRA or mixed waste as the preferred remedial alternative. Under this scenario, it would not longer be cost effective to send Operable Unit 2 hazardous waste off-site when an on-site disposal facility would be available.

Action: Sections 2, 5, 6, and Appendix B of the FS have been revised to reflect the fact that the CAMU is not the basis for on-site disposal cell disposal of Operable Unit 2 wastes.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: NA Page #: NA Line #: NA Code:
Original General Comment: 7

Comment: The FS report discusses National Oil and Hazardous Substances Contingency Plan (NCP) expectations for developing and screening remedial alternatives. This discussion should also note that it is appropriate to consider the other Ous at FEMP when evaluating the extent to which NCP expectations are met.

Response: While the OU2 FS must to some extent be independent of the other OUs, it is agreed that volumes of waste and overall disposal of wastes must be coordinated with the other OUs.

Action: See response to General Comment No. 3.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: NA Page #: NA Line #: NA Code:
Original General Comment: 8

Comment: The FS report discusses the principal threats for the subunits in OU2. Based on the definitions of principal and low-level threats in the NCP, it does not appear that any of the OU2 wastes should be considered to be principal threats. Rather, OU2 wastes are best defined as low-level threats. Categorizing the wastes as low-level threats would help in developing OU2 alternatives that better meet the NCP expectations for remediation of low-level threats. The FS report also describes contaminated groundwater as a principal threat. This is not appropriate. According to the NCP, only sources, not contaminated groundwater, are categorized as principal or low-level threats. Remediation of contaminated groundwater involves a separate NCP expectation for the degree of cleanup based on beneficial use. The FS report should be revised to explain that the OU2 wastes are considered to be low-level threats.

Response: Section 4.0 of the FS discusses the differences in expectations between a principal threat and a low long-term threat as defined in the NCP. DOE agrees that under administrative control much of the waste in Operable Unit 2 could be considered a low long-term threat. However, due to the placement of the waste in the Inactive Flyash Pile and South Field and the vulnerable hydrogeology located underneath, we believe closer to the waste in those subunits falls in the definition of principal threat.

Action: Section 4.2.1 has been modified to indicate how Operable Unit 2 waste is defined according to the NCP.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: NA Page #: NA Line #: NA Code:
Original General Comment: 9

Comment: The FS report and appendices contain a large number of editorial, spelling, and grammatical errors as well as errors of omission and transcription. The entire document requires additional quality assurance and quality control (QA/QC) review.

Response: Agreed.

Action: Additional text editing of the document was incorporated in the revised FS.

APPENDIX C

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix C Page #: NA Line #: NA Code:
Original General Comment: 10

Comment: Throughout Appendix C several terms are used to describe materials present at the various subunits. These terms include the following: contaminated material, most highly contaminated material, contaminated ash material, contaminated fill material, and contaminated surface soil. The use of these terms needs to be reviewed. At present, the terms are used somewhat interchangeably, which results in some confusion. For example, Table C.7-10 presents concentrations of the contaminants of concern (COC) for the Lime Sludge Ponds, and the column of concentrations in the table is labeled "Contaminated Surface Soil." However, the note to the table states that the concentrations represent "the 95% UCL [upper confidence limit] for the most highly contaminated material." Each of the terms specified above should be clearly defined and used consistently throughout the appendix.

Response: This comment will be addressed.

Action: The use of the terms: contaminated material, most highly contaminated material, contaminated ash material, contaminated fill material and contaminated surface soil are used to distinguish between types of waste considered for remediation and the level of contamination expected (e.g. contaminated material is greater than background, most highly contaminated material is the 95% UCL of the contaminated material). In some subunits waste material such as ash or sludge is being treated different than soils, thus contaminated ash is distinguished from contaminated material that includes both ash and soil. The use of waste terms has been defined in the text and checked for consistency.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix C Page #: NA Line #: NA Code:
Original General Comment: 11

Comment: Appendix C devotes Section C.2.1.2 and most of Attachment III to the derivation and presentation of medium- and receptor-specific preliminary remediation goals (PRG). However, the use of PRGs with regard to characterizing alternative-specific short- and long-term risks is not clearly discussed. Although Section C.2.2.3 states that "exposure point concentrations used to estimate intake are PRGs," PRGs are not in fact used to represent exposure point concentrations in the characterization of either short- or long-term risks. The appendix should be revised to clearly associated with each remedial alternative.

Response: This comment will be addressed.

Action: Baseline concentrations are used for short-term risks. PRGs are used for long-term risk source terms depending on alternatives. Appendix C has revised to more clearly describe this subject.

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Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix C Page #: NA Line #: NA Code:
Original General Comment: 12

Comment: Appendix C does not characterize short-term risks to remedial workers. Specifically, Table C.2-1(a) states that "remedial workers are assumed to be protected." Correct use of personal protective equipment (PPE) will effectively eliminate remedial worker exposure to contaminants via inhalation of air and via ingestion of the dermal contact with soil. However, PPE will not eliminate remedial worker exposure to external radiation. Remedial workers will be exposed to external radiation while completing the remedial alternatives at OU2. The Fernald Environmental Management Corporation (FERMCO) acknowledged this type of exposure and characterized risks associated with external radiation for remedial workers as part of the OU1 FS. Appendix C should be revised to characterize short-term risks to remedial workers associated with exposure to external radiation.

Response: This comment will be addressed.

Action: Short-term risks to remedial workers associated with exposure to external radiation has been added to Appendix C, as well as the calculations. These short-term risks are addressed in general terms in Section C.2.2.2, C.2.2.3, and C.2.4.1.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix C Page #: NA Line #: NA Code:
Original General Comment: 13

Comment: For each of the subunits, Appendix C summarizes the short- and long-term risks associated with each of the alternatives. However, the summaries contain little in the way of comparison between alternatives. Because the ability of an alternative to reduce short- and long-term risks constitutes two of the criteria used to select remedial alternatives, the discussion of each subunit needs to be revised to clearly identify which alternatives are associated with the lowest short- and long-term risks.

Also, the appendix should be revised to include an in-text summary table that presents the range of short- and long-term risks associated with the alternatives for each subunit. This table should specifically identify the short- and long-term risks associated with the alternative or alternatives that present the lowest short- and long-term risks for each subunit.

Response: This comment will be addressed.

Action: Risk assessment results are summarized in Section C.9.0 including a comparison of the rand of short- and long- term risk associated with each Operable Unit 2-wide alternative to support the detailed alterative development (Section 5) and the comparative analysis of alternatives (Section 6). The discussion of each subunit risks has been grouped by alternative to better support the Feasibility Study's discussion and comparison of each Operable Unit 2-wide alternative.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix C Page #: NA Line #: NA Code:
Original General Comment: 14

Comment: As discussed in Section C.2.1.3.1 and presented in the tables of Attachment I, the number of trucks needed to transport contaminated material was calculated by dividing the volume (adjusted for expansion) of the contaminated material by the capacity of an average truck (assumed to be 20 cubic yards [yd^3]). This approach is acceptable for some of the alternative-specific calculations. However, for some of the calculations, the assumption that an average truck will transport 20 yd^3 means that this truck would transport more than its maximum load in terms of weight.

For example, for South Field Alternative 3 (Table C.4-3) an average truck is assumed to transport 20 yd^3 or 540 cubic feet (ft^3) of a material with an assumed density of 100 pounds per ft^3. This means that the average truck is assumed to transport 540 ft^3 x 100 pounds/ft^3 or 54,000 pounds. However, Table C.4-3 indicates that the maximum truck capacity is assumed to be 50,000 pounds. If the maximum truck capacity is correct, then the average truck can transport only 18.5 yd^3 of contaminated material. This difference is significant because, assuming an 18.5-yd^3 capacity, the number of trucks necessary to transport the contaminated material increases from 13,421 to 14,500. The increased number of trucks impacts the characterization of transportation risks and the costs of the affected alternatives. Attachment I should be closely reviewed and alternative-specific worksheets should be revised to ensure that trucks are not assumed to carry more than their maximum capacity. In addition, Appendix C should be revised to incorporate updated transportation risks, and the OU2 FS report should be revised to incorporate updated costs.

Response: This comment will be addressed.

Action: Appendix C has been clarified to reconcile the volume and weight capacity of the transport trucks. The number of trucks, transport risks, and costs has been revised throughout Appendix C, particularly Section C.6.0, C.7.0 and C.9.0.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix C Page #: NA Line #: NA Code:
Original General Comment: 15

Comment: Alternative-specific risks are not presented and discussed clearly in some cases. Many of the tables in Attachment II are identified by description and not by number, resulting in some confusion. For example, Tables C.3-11(a) and (b) are labeled "Consolidation/Containment." In contrast, Section C.3.4 identifies the consolidation and containment alternative addressed in these tables as Active Flyash Pile (AFP) alternative AFP5. Tables C.3-11(a) and (b) should be revised to indicate that the risks presented are for alternative AFP5. All tables in Attachment II should be revised to clearly indicate which alternatives they are associated with.

Some of the tables in Attachment II present a single set of risk results identified as representing multiple alternatives. For example, Table C.5-16(a) is labeled as "Alternative 3/4/5/6/7/8." From this, the reviewer infers that the risk to the off-property farmer from each of these alternatives is identical. However, the text does not clearly explain or justify the assumption that the risk is identical for each of the alternatives. Appendi C should be revised to explain and justify each instance in which the risks from various alternatives are assumed to be identical and as a result are presented as a single set of risk results.

Response: These comments will be addressed.

Action: The tables in Attachment II have been revised as needed to clearly indicate the associated alternative. Appendix C has been revised to explain and justify each instance in which the risks from various alternatives are assumed to be identical and as a result are presented as a single set of risk results. Remedial action risk results, residual risk results, and a risk assessment summary are presented in Section C.6.0, C.7.0, and C.9.0, respectively.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix C Page #: NA Line #: NA Code:
Original General Comment: 16

Comment: Attachment II includes tables presenting risks associated with exposure to contaminated groundwater, beef, milk, and homegrown produce. However, Appendix C, specifically Table C.2-2(b), does not include pathway parameters necessary to verify exposures and risks associated with these media. The appendix should be revised to include pathway parameters for exposure pathways associated with groundwater, beef, milk, and homegrown produce.

Response: This comment will be addressed.

Action: Pathway parameters for all short- and long-term scenarios have been provided in Section C.3.0 along with intake and concentration equations, including exposures associated with groundwater, beef, milk, and homegrown produce.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix C Page #: NA Line #: NA Code:
Original General Comment: 17

Comment: Through out Appendix C, carcinogenic risks are presented with two significant figures (for example, 1.5E-05). U.S. EPA guidance indicates that carcinogenic risks should be presented with only one significant figure (for example, 2E-05). Appendix C should be revised to present carcinogenic risks with only one significant figures.

Response: This comment will be addressed.

Action: No action is required.

APPENDIX D

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix D Page #: NA Line #: NA Code:
Original General Comment: 18

Comment: Appendix D discusses COCs, development of PRGs for COCs in soils and waste, and fate and transport modeling of the COCs. It appears that the text does not discuss all the COCs for the various subunits identified in the OU2 remedial investigation (RI) but instead focuses on uranium isotopes and technetium-99. The text should be revised to state why not all COCs identified in the RI are included in the development of PRGs and in the fate and transport modeling.

Response: Appendix D-1 to D-3 discusses only the soil COCs for the cross media impact to groundwater and developments of cross-media PRGs in the soil and waste to be protective of the groundwater. Only TC-99 and uranium isotopes were identified as groundwater COCs in the RI. Therefore, only these two COCs are discussed in these Appendix.

Action: Text will be modified to clarify the purpose of the Appendix.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix D Page #: NA Line #: NA Code:
Original General Comment: 19

Comment: The text should be revised to state the predicted combined groundwater contaminant concentrations (present and future) for all the subunits in OU2 with regard to the remediation method that is considered to be the most likely alternative.

Response: Agreed.

Action: The three southern units were modeled together. Please note the groundwater under the two northern units flows in different directions and is, therefore, not additive with each other or with the southern units. Therefore, the combined units are modeled in the revised FS.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix D Page #: D-1-16 Line #: 21,22, and 23 Code:
Original General Comment: 20

Comment: The text states that PRGs for the Solid Waste Landfill that are protective of perched groundwater were developed because perched groundwater is the closest exposure point for this subunit. In subsequent sections of the text, perched groundwater is identified beneath the Inactive Flyash Pile, South Field, and Active Flyash Pile; however, PRGs that are protective of perched groundwater were not developed for these subunits. Instead, PRGs that are protective of the Great Miami Aquifer were developed even though perched groundwater would be a closer exposure point in each case. The text should be revised to state why PRGs that are protective of perched groundwater were not developed for these subunits.

Response: Due to increased sand/gravel thickness at the Solid Waste Landfill, perched water was considered a potential source of drinking water. However, sand/gravel thickness at the South Field/Inactive Flyash Pile/Active Flyash Pile is approximately 2 feet and has a low yield. Furthermore, the Great Miami Aquifer is exposed near these subunits. Therefore, perched water at these subunits was not considered as a source of water consumption by humans or for irrigation. For these reasons, no COCs were identified in the RI and no PRGs were developed that are protective of the perched water at the South Field/Inactive Flyash Pile/Active Flyash Pile.

Action: Text was revised in Section 2.4.4.4 (p. 2-48) to explain the approach to perched groundwater.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix D Page #: D-3-5 Line #: 2 to 6 Code:
Original General Comment: 21

Comment: The text in Appendix D and in following sections discusses exclusion of sand and gravel lenses in the till and weathered till from the vadose zone modeling. The greater permeability of the sand and gravel lenses and the weathered till would seem to increase the amounts and concentrations of contaminants reaching the Great Miami Aquifer and to decrease the migration time of the contaminants to the aquifer. The text should be revised to state the rationale for excluding sand and gravel lenses and weathered till from the model.

Response: Exclusions of a layer means that travel time is assumed to be zero across that layer and that no adsorption takes place in that layer and concentration of contaminants remain unchanged. Therefore, exclusion of sand and gravel lenses in the till and weathered till in the vadose zone modeling results in increased amounts and concentration of the contaminants. This is a conservative assumption.

Action: In the revised FS, Section D.1.2 indicates that the travel time due to the referenced layers was not included in the model.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix D Page #: D-3-8 to 9 Line #: 1-2, 33-35 Code:
Original General Comment: 22

Comment: The text in Appendix D and in following sections discusses inclusion of contaminated till in the model source term and in the overall till thickness. If the contaminated till is included in the source term, it should not be include in the till thickness as well. Including the contaminated till in the till thickness increases the migration time for contaminants to groundwater. The text should be revised to include the contaminated till in the source term only.

Response: For contaminant migration (travel time) calculations, impacted till was included only in the source term. However, unimpacted till and impacted till have the same hydraulic conductivity, porosity, and other hydraulic properties. Therefore, for the purposes of estimating infiltration rates using HELP model (HELP model uses only hydraulic properties and does not need source term definition), unimpacted and impacted till were lumped together (see lines 34-35 on page D-3-8 and lines 1-2 on page D-3-9).

Action: The text was revised in Section D.1.3.2 on page D-1-17 to clarify the travel time concern.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix D Page #: D-3-54 Line #: 19-20 Code:
Original General Comment: 23

Comment: The text discusses uranium isotopes as the only COCs modeled for the on-site disposal cell. Previous text and the RI report discuss additional contaminants as COCs for the subunits in OU2. The text should be revised to discuss why uranium isotopes were the only COCs modeled for the on-site disposal cell.

Response: Only contaminants that were COCs at the subunits were considered as possible COCs at the disposal cell.

Action: Text explaining this logic has been added to Appendix D (See Section D.1.6 on page D-1-77).

APPENDIX I

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix I Page #: NA Line #: NA Code:
Original General Comment: 24

Comment: On four randomly selected pages of the text, reference citations were compared with Section I.13.0; numerous errors of commission and omission were found. For example, on Page I-7-1, all three citations on lines 25 and 27 have the wrong letter suffix on the date. Also, the citation "Rundo and others (1986)" on line 18 does not have a corresponding reference in Section I.13.0. All citations in Appendix I should be reviewed to ensure that they call out the proper references in Section I.13.0.

Response: This comment will be addressed.

Action: All citations in Appendix I have been reviewed to ensure that they call out the proper references in Section I.13.0.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: I.1.6 Page #: I-1-30 Line #: NA Code:
Original General Comment: 25

Comment: The text presents routes by which receptors may be exposed to COCs in soil. However, dermal contact is not mentioned. The text should be revised to include dermal contact with soils. Also, the potential for receptor exposure to COCs that leach from soil and migrate to surface water or groundwater is not discussed. The text should be revised to discuss these additional potential pathways for exposure.

Response: This response will be addressed.

Action: The discussion has been clarified to include all potential pathway exposures in Section I.1.5 (p. I-1-25). Dermal contact has been described as a route by which receptors may be exposed to COCs in soil.

Potential receptor exposure to COCs that leach from soil and migrate to surface water or groundwater has been clarified.

Commenting Organization: U.S. EPA Commentor: SARIC
Section #: I.1.6 Page #: I-1-20 Line #: NA Code:
Original General Comment: 26

Comment: The text lists the features and contaminant sources present following site-wide remediation. Of all on-site media, only surface soil is presented as a potential source of residual contamination. This infers that groundwater, surface water, and sediment either are fully remediated or do not require remediation. If this is the case, it should be clearly stated in the text, or these media should be added as potential sources of residual contamination.

Response: Groundwater, surface water, and sediment are evaluated as future cross-media pathways from the residual soil contamination on the FEMP in the CRARE.

Action: The text in Section I.1.5 (p. I-1-15) has been clarified to state that following site-wide remediation surface soil, groundwater, surface water and sediment are potential sources of residual contamination and were evaluated in the CRARE.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: I.2.0 Page #: I-2-1 Line #: NA Code:
Original General Comment: 27

Comment: The text discusses sources of data for the FS report and states that data from non-RI/FS activities were considered "secondary" and were used in the report only when RI/FS data were not available. However, the report does not state the procedures followed when (1) RI/FS data and "secondary" data were in conflict and (2) RI/FS data were available but were invalidated, inadequate, or suspect. The text should be revised to address this issue.

Response: The CRARE is a postremediation document using cleanup standards for selected COCs and not "raw" analytical data. Surface soil and subsurface soil concentrations are set to PRGs (PRLs) for exposure estimates.

Action: The text has been modified in Section I.2.0 (p. I-2-1) to clearly identify the sources of data used in the CRARE.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: I.4.2 Page #: NA Line #: NA Code:
Original General Comment: 28

Comment: Appendix I presents a series of three screening processes conducted to select COCs that will potentially still be of concern following the 70-year remediation project. The second and third processes are essentially modeling exercises that may or may not predict how COCs will behave in the environment. Although such processes may be necessary and proper, they should be presented in the context of their inherent uncertainty, and provisions should be made to attempt to validate the models. For example, representative COCs proposed for elimination based on this modeling should be analyzed for at intervals over the 70-year remediation period to determine whether the models are reliably predicting actual events.

Response: This comment will be addressed.

Action: The uncertainties inherent in the two screening processes are discussed in general terms in Section I.4.2 (p. I-4-3) and in more extensive terms in Section I.10.0.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: I.4.4 Page #: I-4-8 Line #: NA Code:
Original General Comment: 29

Comment: The text states that COCs with a vapor pressure greater than 10 millimeters (mm) of mercury (Hg) at 20 ^{0}C will be eliminated because they are expected to volatilize over the 70-year remediation period. However, no explanation is provided of how the 10 mm of Hg indicator was determined to be an acceptable cutoff point. Also, the report does not justify the use of vapor pressure as a predictor of COC volatility from soil. Another value such as a COC's Henry's Law constant, which considers both vapor pressure and solubility, may be better predictor of volatilization in the environment. The report should justify the use of the 10 mm of Hg indicator and the use of vapor pressure over other predictors of volatility.

Response: This comment will be addressed.

Action: This approach is based on a concept incorporated by reference in Volume III of the Air Superfund National Technical Guidance from two 1985 documents (e.g., the Superfund public health exposure manual and the Chemdat6 User's Guide). Additionally, Volume II (Page 29) of this series define volatile at > 1mm of Hg vapor pressure to be conservative a function of ten was applied to this definition. As Henry's law deals with vapor pressure over a water solubility factor, it is believed that the proposed method is the more appropriate approach for the air pathway. This is addressed in Section I.4.2.2 (p. I-4-9).

Commenting Organization: U.S. EPA Commentor: Saric
Section #: I.4.4 Page #: I-4-9 Line #: NA Code:
Original General Comment #: 30

Comment: Review of Table I.4-3 indicates that several COCs were eliminated even though they are identified as semivolatile organic compounds in U.S. EPA guidance (U.S. EPA 1989) or have published vapor pressures of less than 10 mm of Hg (HSDB 1994 and U.S. EPA 1986). These COCs include 1,2-dichlorobenzene (1.0 mm of Hg at 20 °C); 2-chlorophenol (2.2 mm of Hg at 20 °C); and N-nitrosodiethylamine (0.1 mm of Hg at 25 °C). The COCs eliminated should be reviewed and included in Table I.4-3, or U.S. DOE should provide justification for eliminating them.

Response: This comment will be addressed. It was an error to indicate in Table I.4-3 that dichlorobenzene; 2-chlorophenol; 2,6-dinitrotoluene; and N-nitrosodiethylamine were eliminated on the basis of vapor pressure. These four compounds were actually eliminated on the basis of soil half-life.

Action: The elimination of these compounds on the basis of soil half-life is documented and justified in Section I.4.2.3 (p. I-4-13 to I-4-16).

Commenting Organization: U.S. EPA Commentor: Saric
Section #: I.4.5 Page #: NA Line #: NA Code:
Original General Comment #: 31

Comment: Section I.4.5 presents a screening method that involves estimating the percent of an initial COC concentration remaining after 70 years of degradation. COCs reduced by at least 99.9 percent are eliminated. However, the elimination should be linked to reduction of risk and not simply reduction in concentration. A COC contributing a carcinogenic risk of 10^{-2} could be reduced by 99.9 percent and still contribute a risk of 10^{-5}. The text should be revised to link elimination of a COC with risk reduction.

Also, the report estimates percent reduction for individual COCs when it is possible to estimate a minimum half-life (2,563 days) required to retain a COC. Calculation of half-lives rather than percent reduction of COCs would reduce the total calculations required and would allow more focus on the appropriateness of the reported half-lives.

Response: This comment will be addressed.

Action: Additionally, in support of this approach, it is shown in Section I.4.2.3 (p. I-4-13) that any compounds evaluated in the OU2 RI baseline risk assessment, which were eliminated using this technique, would not pose a significant carcinogenic risk if reduced by 99.9%.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: I.4.5 Page #: I-4-14 and I-4-15 Line #: NA Code:
Original General Comment #: 32

Comment: Table I.4-4 lists half-lives for various organic COCs. However, only single values are reported when available literature provides a range of values. For example, the table lists a half-life of 530 days for benzo(a)pyrene, but literature values range as high as 693.5 days (HSDB 1994). It would be more appropriate to present a range of literature values for each COC to determine whether to eliminate the COC. If the critical half-life value for retention of a COC is within the literature range, the COC should be retained.

Response: As stated in the text, to be health conservative, the longest half-lives reported in the literature were used in environmental degradation estimations.

Action: The HSDB (1994) reported half-life of 693.5 days for benzo(a)pyrene was confirmed and has been used in environmental degradation estimates. this value is shown in Section I.4.2.3 (Table I.4-4, p. I-4-15).

Commenting Organization: U.S. EPA Commentor: Saric
Section #: I.5.1 Page #: I-5-3 Line #: NA Code:
Original General Comment #: 33

Comment: The text states that no major demographic changes near the facility are envisioned. However, this report addresses risk for 1,000 years following remediation. Therefore, this assumption of no new recreational areas, urban population centers, and commercial or industrial areas near the facility requires additional discussion and support. The report should be revised to include such supporting discussion.

Response: DOE believes that the assumption of no demographic changes near the facility is the most human health protective and conservative assumption. DOE is already evaluating the most conservative on-site human receptors for the post remediation facility, which are the on-site farm residents. The on-site farm resident receptors are modeled for a 70 year residential exposure and are modeled to consume on-site produced vegetables and fruit, meat, and dairy products.

Action: Text has been added to Section I.5.1 (p. I-5-3) to clarify that the assumption of no demographic changes near the facility is the most human health protective and conservative assumption. The evaluation of an on-site farmer, who is modeled for a 70 year life time exposure and consumes vegetables and fruit, meat, and dairy products is the most health protective receptor to evaluate in this document.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix I Page #: NA Line #: NA Code:
Original General Comment #: 34

Comment: Appendix I states that several potential receptors were not evaluated because more extensively exposed receptors were included. Elimination of a potential receptor for this reason is acceptable only if the evaluated receptor shows no significant risk. If this is not the case, the less exposed receptor may also be at significant risk. Also, some receptors such as the homebuilder may be exposed to different media (subsurface soil and groundwater) than are other receptors and should not, therefore, be eliminated from consideration. The report should be revised to re-evaluate eliminated receptors in order to include any that (1) may be at significant risk and (2) are exposed to different media than are other receptors.

Response: To accommodate the USEPA Comment, it is proposed that one new receptor a GMR user be added to the CRARE, and additional justification for screening the home builder scenario be provided. The home builder scenario is actually a subchronic exposure over a less than one-year period. As such, a one-year exposure in the long term residual time-frame of the CRARE which emphasizes the chronic exposures is misplaced. Post-remediation subsurface concentrations (PRG) do not exceed surface soil concentrations (PRG).

Action: Text has been revised to reflect these changes in Section I.2.2 (p. I-2-11), I.5.1.3.1 (Table I-5-1, p. I-5-5 & I-5-9).

Commenting Organization: U.S. EPA Commentor: Saric
Section #: I.5.2.1 Page #: I-5-12 Line #: 22 Code:
Original General Comment #: 35

Comment: This bullet lists potential sources of residual contamination in remediated OUs at the facility but does not include contaminated sediment, which may be a medium of exposure and may be a source of contaminants migrating to surface water. Contaminated sediment should be added to the list of potential sources of residual contamination in remediated OUs.

Response: This CRARE is making the assumption that the sediment will be remediated so the pathway would not pose an unacceptable risk. This assumption will be confirmed in the Operable Unit 5 CRARE or the risk from the sediment will be included.

Action: Text has been modified in Section I.5.2.1 (p. I-5-14) to include this assumption.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Appendix I Page #: NA Line #: NA Code:
Original General Comment #: 36

Comment: Several sections of Appendix I appear to be duplicated exactly from Appendix D.5. It would be more efficient to summarize Section D.5 in Appendix I and then refer the reader to Appendix D for more information. Sometimes the duplication is not quite exact, and the small differences infer completely different meanings. For example, the first paragraph in Section I.6.2 essentially duplicates the first paragraph in Section D.5.1 except that Section I.6.2 refers to "contaminants released to the atmosphere from the remediated FEMP." whereas Section D.5.1 refers instead to "deposition rates from the remediated Operable Unit 2 subunits." The text should clearly state whether emissions from all of FEMP or only from the OU2 subunits are described in this Comprehensive Response Action Risk Evaluation (CRARE). Moreover, all text and appendixes should be checked for consistency.

Response: U.S. EPA has read the text in Appendices D and I correctly. Appendix D presents air modeling for the remediated OU2 subunits. Appendix I presents air modeling for the post remediation FEMP, including all OUs. The two independent sets of air modeling were performed by the same air modeling team, who authored the above cited text using the same writing style and format.

Action: None required.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: I.6 Page #: NA Line #: NA Code:
Original General Comment #: 37

Comment: No uncertainty discussion is presented in the text for this air emissions fate and transport analysis. Given the number of assumptions that must be made, at least a qualitative evaluation of the uncertainty associated with each assumed input parameter should be presented.

Response: The uncertainties associated with air modeling are described in Section 10, Uncertainties.

Action: Additionally, text has been added in Section I.10.5.1 (p. I-10-12 to I-10-14) to address this comment.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: I.6.0 Page #: I-6-2 Line #: NA Code:
Original General Comment #: 38

Comment: The test states that all FEMP CRAREs will use the same input and default values. It is likely that some values should be OU-specific, such as the areal extent of the site, contaminant concentrations, the type of soil present, the presence or absence of a cap, and so on. The statement in the text should be corrected to allow for OU-specific values.

Response: This comment will be addressed.

Action: The text has been clarified to allow OU-specific input values for parameters including areal extent of OU, contaminant concentrations, soil types present, and presence or absence of a cap.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: I.6.2.1 Page #: I-6-63 Line #: NA Code:
Original General Comment #: 39
Comment: The first paragraph states that future land use scenarios do not include continued maintenance of on-property disposal or capped areas. The second paragraph states that no significant air emissions are expected to occur from such areas and states specific areas where no air emission source terms are anticipated. The problem with assuming that no air emissions will occur because of capping is that if no maintenance occurs, eventually the cap will wear away because of erosion. Once the cap is gone, air emissions will occur. Therefore, if maintenance work in the capped areas is not to be considered, further justification should be provided for not assuming air emissions, or air emissions associated with cap deterioration should be included in air transport modeling.
Response: The statement in the first paragraph is incorrect.
Action: Section I.6.2.1 has been revised to clarify source term assumptions for air transport modeling.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: I.6 Page #: I-6-101 Line #: 22 Code:
Original General Comment #: 40
Comment: Table I.6-13 shows radon emission fluxes from the RAECOM model for different sites at FEMP. The text states that these fluxes are also shown in Attachment I.III; however, only OU2 fluxes are shown in this attachment. Also, Attachment D.5.1-I contains RAECOM fluxes for OU2 sites and other sites, although the correspondence with the sites listed in Table I.6-13 is not clear. Most importantly, the values listed in these attachments are not the same as those listed in Table I.6-13. RAECOM-modeled fluxes should be completely listed and clearly referenced to specific sites; the values listed in Table I.6-13 should clearly correspond with RAECOM output; and the emission values of Industrial Source Complex Dispersion Model, long-term (ISCLT) should be carefully checked to make certain that the correct values were used for the ISCLT model.

Also, the RAECOM flux printout shows both input parameters and output flux rates and concentrations. One of the input parameters is "bare source flux (Jo) from layer 1" expressed in units of picocuries per square meter per second. The method used to calculate this input flux is not stated in the text or any attachment, but it should be.
Response: This comment will be addressed.
Action: Values have been checked and sources and uses of radon data have been clarified in Section I.6.2.5 (p. I-6-74 to I-6-75) and Section I.6.2.9 (p. I-6-78 to I-6-80).

Commenting Organization: U.S. EPA Commentor: Saric
Section #: I.7.0 Page #: NA Line #: NA Code:
Original General Comment #: 41

Comment: This toxicity assessment contains many internal inconsistencies in format, style, grammar, and diction. Examples of the inconsistency are (1) the greatly varying level of detail among the individual contaminant discussions, (2) the random missing of discussions under the subheading "noncarcinogenic toxicity" with others having the subheading "toxicity" and still others having no subheading at all, and (3) the inconsistent inclusion of toxicity values (reference doses and slop factors).

Response: This comment will be addressed:

Comment (1): The varying level of discussion among individual contaminant profiles reflects both the amount of information accessible in the literature about these substances, and professional judgement concerning the appropriate level of detail necessary to adequately discuss the toxicity of each substance.

Comments (2) and (3) reflect format inconsistencies.

Action: Comment (1). No action was required.

Comment (2) and (3). Format and presentations have been standardized.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: I.7.1 Page #: 1-7-1 Line #: 25 Code:
Original General Comment #: 42

Comment: The two citations on this line are obsolete. The Integrated Risk Information System (IRIS) is updated monthly. IRIS should be checked for changes and additions as late as practical during preparation of a risk assessment; such a check would have been appropriate in mid-March for this April 29, 1994, document. The Health Effects Assessment Summary Table (HEAST) is issued annually. Therefore, the 1993 edition of HEAST should have been used for this draft FS report, and the 1994 edition should be used for the revised draft. It is imperative that current toxicity values be used in all risk assessments.

Response: The comment on IRIS will be addressed.

The most current HEAST edition will be used. As discussed, the 1993 edition of HEAST will be used as the 1994 edition is draft.

Action: The IRIS citations have been updated in Section I.7.1.

000035

Commenting Organization: U.S. EPA Commentor: Saric
Section #: I.7.6.17 Page #: I-7-59 Line #: NA Code:
Original General Comment #: 43

Comment: The text states that the lead uptake/biokinetics model is not applicable to this risk assessment because no data on residential exposure variables are available. First, the model contains default variables to use when site-specific variables are not available. Second and more importantly, FEMP does have analytical data on lead concentrations in environmental media that can be used as input for the uptake/biokinetics model, either directly (as for surface soil that is ingested) or indirectly through dispersion models (as for airborne particulates that can be inhaled). The uptake/biokinetic model should be used to provide a quantitative estimate of the risk from the lead at the site.

Response: The peak OU2 soil lead concentrations are less than 125 mg lead/kg soil. This lead level is less than the CERCLA benchmark soil lead concentration of 500-1000 mg/kg for CERCLA sites. Therefore, DOE believes that the OU2 soil lead concentrations are not high enough to trigger the need for the lead uptake biokinetic model for the OU2 CRARE.

Action: Text has been added in Section I.7.6.16 (p. I-7-56) to document the DOE position that since peak OU2 soil lead concentrations are less than the 500-1000 mg/kg benchmark concentrations for Superfund sites, the OU2 soil lead concentrations are not high enough to trigger the need for the lead uptake biokinetic model for the OU2 CRARE.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: I.8.2 Page #: I-8-2 Line #: NA Code:
Original General Comment #: 44

Comment: The text states that a soil ingestion rate of 100 milligrams per day was used for the groundskeeper receptor and points out that this value was used in the OU4 RI report. Regardless of the precedent for the use of this value, it appears too low to reflect the high level of contact with soil that a groundskeeper would be expected to have. The report should be revised to evaluate the groundskeeper receptor with a higher, more conservative intake rate such as 200 milligrams per day.

Response: Disagree. Based on the multitude of tasks the groundskeeper would be expected to perform over the calendar year, and seasonal fluctuations in soil exposure, DOE believes an average soil ingestion rate of 100 milligrams per day is appropriate. This is consistent with previous risk assessments performed at Fernald.

Action: Additional text will be added in Section I.8.2 (p. I-8-2) to clarify the assumptions (stated above) supporting the average soil ingestion rate of 100 milligrams per day.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: I.9 Page #: NA Line #: NA Code:
Original General Comment #: 45

Comment: Methods are not provided for choosing the chemical-specific concentrations used to determine the chronic daily intake values. A single concentration is provided for each COC within each scenario. Section I.12.3 states that estimation of health risk is based on a single receptor point; therefore, it appears that the COC concentrations is associated with the receptor point. However, the methodology for choosing the receptor point locations and concentrations is not provided. The report should be revised to include all appropriate methodology and receptor point locations.

Response: This comment will be addressed.

Action: The methodology used to choose receptor point locations and concentrations will be clarified in Section I.9.1 (p. I-9-1 to I-9-5).

Commenting Organization: U.S. EPA Commentor: Saric
Section #: I.11.0 Page #: I-11-1 Line #: 26 Code:
Original General Comment #: 46

Comment: The text states that organic COCs were eliminated from consideration after evaluation of their organic decay rates in water and soil. However, Section I.4.5 discusses elimination of COCs in soil based on decay and in groundwater based on removal via pump and treat methods. The text should be revised to clarify the different methods used to eliminate organic COCs in soil and groundwater from consideration.

Response: This comment will be addressed.

Action: Text has been added in Section I.11.1 (p. I-11-1 to I-11-3) to clarify the different methods used to eliminate organic COCs in soil and groundwater from consideration.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: I.11.3 Page #: NA Line #: NA Code:
Original General Comment #: 47

Comment: In general, the presentation of uncertainties in this section is skewed toward uncertainties potentially resulting in overestimation of risk. Although it is acknowledged that general risk assessment procedures and standard default assumptions are highly conservative, several sources of uncertainty can lead to overestimation of risk. The discussion of uncertainties should be revised to present more information on uncertainties potentially resulting in underestimation of risk. For example, chemical not included in the quantitative risk assessment as a consequence of missing information on health effects or lack of quantitation in the chemical analysis, may provide a significant source of uncertainty which may underestimate final risk estimates (EPA 1989).

Response: This comment will be addressed.

Action: Text has been added in Section I.11.3 (Table I.11-6, p. I-11-15 & I-11-16) to the discussion of uncertainties to present more information on uncertainties potentially resulting in underestimation of risk, as necessary and appropriate. Text has been added to clarify that chemcials not included in the quantitative risk assessment as a consequence of missing information on health effects or lack of quantitation in chemical analysis, may provide a source of uncertainty which may underestimate final risk estimates.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: I.11.3 Page #: I-11-12 Line #: NA Code:
Original General Comment #: 48
Comment: The test states that some model results tend to misrepresent exposure scenarios. However, the report does not propose use of alternative models or methods for adjusting model results to accurately represent exposure scenarios. The report should propose methods for addressing this uncertainty and should attempt to describe whether the uncertainty may result in overestimation or underestimation of risk.
Response: This comment will be addressed.
Action: The text has been clarified in Section I.11.3 (Table I.11-6, p. I-11-5, p. I-11-15 & I-11-16).

Commenting Organization: U.S. EPA Commentor: Saric
Section #: I.11.3 Page #: I-11-12 Line #: 27 Code:
Original General Comment #: 49
Comment: The text states that assumptions concerning meat, milk, fruit, and vegetable consumption at and near the facility are conservative and unlikely. However, the report does not explain (1) how the assumptions can be judged to be conservative and unlikely if no data from the facility or similar communities are available or (2) why, if such data is available, they were not used in the place of conservative and unlikely assumptions. The text should be revised to address these issues.
Response: This comment will be addressed.
Action: The cited text has been deleted from Section I.11.3 (p. I-11-3).

Commenting Organization: U.S. EPA Commentor: Saric
Section #: I.12 Page #: NA Line #: NA Code:
Original General Comment #: 50
Comment: CRARE conclusions are not consistent with risks presented in the text. The conclusions are based on each OU's percent contribution to the site's total residual risk. However, risk calculations are based on a single receptor point and are not presented separately by OU in the text. Therefore, the conclusions should include (1) additional conclusions summarizing significant risks presented in the text and (2) the methodology for the calculation of each OU's percent contribution.
Response: This comment will be addressed.
Action: Section I.12.0 has been revised to include additional conclusions summarizing significant risks and to clarify the methodology for the calculation of each OU's present contribution.

REFERENCES

Hazardous Substances Database (HSDB). 1994. On-Line Database.

U.S. EPA. 1986. "Superfund Public Health Evaluation Manual." EPA 540/1-86-060. October

U.S. EPA. 1989. "Risk Assessment Guidance for Superfund, Human Health Evaluation Manual, Part A." U.S. EPA/540/1-89/002.

ENCLOSURE 1
ADDITIONAL TECHNICAL REVIEW COMMENTS ON THE DRAFT FEASIBILITY STUDY (FS) REPORT AND PROPOSED PLAN (PP) FOR OPERABLE UNIT 2 (OU2)

APPENDIX C

Commenting Organization: U.S. EPA Commentor: Saric
Section #: NA Page #: NA Line #: NA Code:
Original Specific Comment #: 1

Comment: The text of Appendix C discusses baseline risks as well as short- and long-term risks associated with subunit-specific remedial alternatives. Much of the time, the text includes references to particular tables in the text or in one of the attachments to Appendix C containing the specific risks results being discussed. However, almost as often, particularly with risks associated with the baseline risk assessment, such references are not included. The appendix should be closely reviewed. Whenever risk estimates are discussed, the text should include references to the tables in which the detailed risk results are presented.

Response: Comment noted, Appendix C will be reviewed and revised.

Action: Text discussing risk estimates will be revised to include reference to specific table in the text, the Appendices or in the Baseline Risk Assessment.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: NA Page #: NA Line #: Code:
Original Specific Comment #: 2

Comment: Short-term subunit-specific risk estimates cannot be verified because values for exposure duration (ED) are not presented. Specifically, Table C.2-2(a) consistently describes the values for this parameter as alternative-specific. The appendix should be revised to clearly present subunit- and alternative-specific values for the ED parameter.

Response: Appendix C will be reviewed to ensure that parameters and calculations or references to calculations are provided.

Action: Revise text to include parameters and reproducible calculations for agency verification.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: NA Page #: NA Line #: NA Code:
Original Specific Comment #: 3

Comment: All tables presented in the appendix, whether in the text or in one of the attachments, are not paginated. In order to minimize the potential for pages to be misordered, all tables should be paginated.

Response: Comment noted.

Action: Tables will be paginated.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: C.2.1.3.1 Page #: C.2-6 Line #: 26 and 27 Code:
Original Specific Comment #: 4
Comment: These two lines use the term "this" ambiguously. The two lines should be revised to clarify what "this" refers to.
Response: Text has been reviewed and will be revised.
Action: Revised text will refer to "this" as the description of individual tasks under each subunit's alternative as described in Section 4.0 of the FS Report.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: C.2.1.3.2 Page #: C.2-8 Line #: 13 Code:
Original Specific Comment #: 5
Comment: This line states that additional information is provided in Section 5.2.3. However, the subject document does not contain such a section. The line should be revised to clarify in which document section 5.2.3 is presented.
Response: Text has been reviewed, the Section referenced is the main body of the FS. At this time this section of the FS is under revision. When the exact reference is set in the revised FS it will be noted on this line.
Action: Revise text.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: C.2.1.3.2 Page #: C.2-8 Line #: 15 Code:
Original Specific Comment #: 6
Comment: This line discusses "this alternative." The line should be revised to clarify which what alternative is being referred to here.
Response: Text referring to "this" alternative is describing the on-site Disposal Cell. Text will be rewritten to state this alternative and reference the current number designation for alternatives.
Action: Revise text.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: C.2.1.3.2 Page #: C.2-9 Line #: 4 Code:
Original Specific Comment #: 7
Comment: This line states that "the ability of the alternatives to meet specified preliminary remediation goals (PRG) was assumed." The meaning of this statement is not altogether clear. The line should be revised to clarify how the statement relates to exposure point concentrations used in the exposure calculations.
Response: This line of text will be rewritten to refer to the On-Site Disposal alternative and a distinction between PRGs, PRLs, and waste acceptance criteria as it pertains to exposure point concentrations.
Action: Revise text.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: C.2.2.1.2 Page #: C.2-11 Line #: 13 Code:
Original Specific Comment #: 8
Comment: This line refers to the baseline risk assessment in the remedial investigation (RI) report for detailed discussions of the intake equations used to calculate exposures. This section should be revised to present section numbers in the baseline risk assessment where intake equations for each of the routes of exposure are presented. For example, Tables C.2-2(a) and C.2-2(b) could easily be revised to include references to the appropriate sections.
Response: To make the FS risk assessment a stand alone document the FS will add intake equations and sample calculations such that the agency can verify results.
Action: Revise text.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: C.2.2.1.2 Page #: C.2-11 Line #: 16 and 17 Code:
Original Specific Comment #: 9
Comment: These lines state that parameter values for evaluating short- and long-term risks are presented in Tables C.2-2(a) and C.2-2(b), respectively. However, these tables do not include parameters to evaluate intakes of contaminants present in groundwater, meat, and vegetables. These lines should be revised to state where these parameters are presented.
Response: Text and tables will be added which will clearly present input parameters for evaluating short-term and long-term risks.
Action: Revise and add text and tables.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: C.2.2.1.2 Page #: NA Line #: NA Code:
Original Specific Comment #: 10
Comment: In Table C.2-2(a) under the section titled "Dermal Contact with Soil/Sediment," the conversion factor (CF) parameter is defined in units of milligrams per kilogram (mg/kg). The units should be revised to be presented in kg/mg. This same revision should be made to Table C.2-2(b).

Also, footnote "c" in this table is too vague as written. The footnote should be revised to indicate the specific source of the guidance. If this guidance was provided by an individual, the footnote should specify the name and title of the individual and the date the guidance was provided.
Response: Units will be revised to kg/mg in both Table C.2-2(a) and (b). Also, footnote "c" will be revised and trespasser scenario will match previous guidance and reference used for the OU1 FS and OU2 RI Risk Assessments.
Action: Revise text.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: C.2.2.1.2 Page #: NA Line #: NA Code:
Original Specific Comment #: 11
Comment: Table C.2-3 contains several equations used to calculate air concentrations of contaminants during various remedial activities. The equations and the value for one of the primary parameters, D_1 (dust loading factor), are not referenced. Table C.2-3 should be revised to include references for the equations and the D_1 parameter.
Response: The reference for Dust loading factors during the short-term risk assessment air modeling will be referenced to the methodology of the Risk Assessment Work Plan Addendum. Any modifications to or recalculation of this value will be clearly documented in the text and referenced in Table C.2-3.
Action: Modify text and provide check of parameter and reference in Table C.2-3.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: C.2.2.1.2 Page #: NA Line #: NA Code:
Original Specific Comment #: 12
Comment: Table C.2-4(a) presents air concentrations and deposition rates of contaminants. Units need to be added to the column labeled "Surface Soil Concentrations." Also, the footnote to the table needs to be revised to state where the off-site receptor is assumed to be located.
Response: A footnote will be added to each contaminant of concern in Table C.2-4(a) to differentiate mg/kg or pCi/g concentrations. A footnote will be added to describe the location of the off-site receptor.
Action: Revise table with footnotes (e.g., mg/kg or pCi/g) and receptor location.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: C.2.2.1.2 Page #: NA Line #: NA Code:
Original Specific Comment #: 13
Comment: Table C.2-5 presents groundwater modeling results. In the first column , the acronyms "AFP" and "SI/IFP" need to be defined . Also, concentration units need to be added to the column presenting on-site concentrations.
Response: The terms AFP (Active Flyash Pile) and SF/IFP (South Field, Inactive Flyash Pile) will be defined in Table C.2-5. Also in Table C.2-5 units of concentration in pCi/l will be added.
Action: Revise Table C.2-5 to add missing information.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: C.2.2.1.3 Page #: NA Line #: NA Code:
Original Specific Comment #: 14
Comment: Table C.2-6(a) presents subchronic reference doses (RfD). However, the table does not clearly indicate why only a fraction of the potential chemicals of concern (COC) are presented. Based on a comparison with Table C.2-6(b), Table C.2-6(a) should either be revised to include values for chromium IV, polyaromatic hydrocarbons (PAH), and polychlorinated biphenyls (PCB), or else state clearly why values for these COCs are not included.
Response: The FS will use chronic RfDs to be consistent with the RAWPA and other OU FSs.
Action: The FS RA will indicate that chronic RfDs were used in the risk assessment and tables of the RfDs will be provided.

Commenting Organization: U.S.EPA Commentor: Saric
Section #: C.2.2.1.3 Page #: NA Line #: NA Code:
Original Specific Comment #: 15
Comment: Table C.2-6(b) presents chronic RfDs. The table is incomplete and should be revised to include RfDs for beryllium (5E-03 mg/kg/day), bis(2-ethylhexyl)phthalate (2E-02 mg/kg/day), and dieldrin (5E-05 mg/kg/day), as reported in the Health Effects Summary Tables, Annual Update fiscal Year 1993. The table should also be revised to include either an RfD for uranium or else clearly state why an RfD is not included.
Response: Agreed. The requested information will be provided.
Action: The FS RA will be clarified to provide chronic RfDs for beryllium, bis(2-ethylhexyl)phthalate, and dieldrin. A chronic RfD for uranium will be provided or else state why an RfD is not included.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: C.2.2.1.3 Page #: C.2-14 Line #: 19 Code:
Original Specific Comment #: 16
Comment: This line states that slope factors are presented in Table C.2-5. The line should be revised to refer to Table C.2-7.
Response: Agreed.
Action: Text has been updated in Section C.4.2 (Table C-4-2).

Commenting Organization: U.S. EPA Commentor: Saric
Section #: C.2.2.1.3 Page #: NA Line #: NA Code:
Original Specific Comment #: 17
Comment: Table C.2-7 presents slope factors. The table is incomplete and should be revised to include the most up-to-date information. For example, dieldrin has a slope factor of 16 $(mg/kg/day)^{-1}$ as reported in the U.S. Environmental Protection Agency (U.S. EPA) Integrated Risk Information System (IRIS) accessed in May 1994. Also, footnote "c" of this table should be revised to specify when IRIS was accessed.
Response: Agreed.
Action: The cancer slope factors have been revised in Section C.4.2 (Table C.4-2) to include the most up-to-date information. Additionally, the reference to IRIS will be revised to specify when IRIS was accessed.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: C.2.2.1.3 Page #: C.2-17 Line #: 14 to 27 Code:
Original Specific Comment #: 18
Comment: The last paragraph on this page, which continues onto the next page describes the default procedures to be used if gastrointestinal information is not available. Based on a review of Table C.2-9, these default procedures are never used, and the reference to it should be removed from the document.
Response: Comment noted and text will be deleted.
Action: Because Appendix C has been extensively rewritten, this specific comment was addressed where appropriate.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: C.2.2.1.3 Page #: NA Line #: NA Code:
Original Specific Comment #: 19
Comment: Table C.2-9 presents dermal RfDs and slope factors. The table should clearly state whether the dermal RfDs presented represent subchronic or chronic exposures. Also, the dermal RfDs and slope factors for PAHs are all labeled "ND" or not derived. This explanation is insufficient. A footnote should be added to the table explaining why these values were not derived and directing the reader to the section where dermal exposure to PAHs is discussed. The table also presents a dermal RfD for PCBs. The origin of this value is uncertain because Table C.2-6(b) indicates that chronic oral and inhalation RfDs are not available for PCBs. Table C.2-9 should be revised to explain and justify the dermal RfD for PCB included in the table.
Response: Agreed.
Action: The requested clarifications concerning dermal RfDs and Cancer slope factors will be provided:

a) Whether the dermal RfDs presented represent subchronic or chronic exposures has been clearly stated in Section C.4.0.

b) The issue of dermal RfDs for PAHs has been clarified in Section C.4.2 (Table C.4-1).

c) The issue of a dermal RfD for PCBs has been addressed in Section C.4.2 (Table C.4-2).

Commenting Specific Organization: U.S. EPA Commentor: Saric
Section #: C.2.2.1.4 Page #: C.2-19 Line #: 20 Code:
Original Specific Comment #: 20
Comment: This line defines the parameter modifying factor (MF). This parameter is not previously defined. In particular, Tables C.2-2(a) and (b) do not define this parameter. The text should be revised to explain the derivation of and assumed value or values for this parameter.
Response: Agreed.
Action: Because Appendix C has been extensively rewritten, this specific comment was addressed where appropriate.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: C.2.2.1.4 Page #: C.2-19 Line #: 24 Code:
Original Specific Comment #: 21

Comment: This line states that exposure to noncarcinogens was evaluated by comparing intakes to subchronic RfDs. However, this statement is inconsistent with others in Appendix C. For example, the second full paragraph on Page C.2-13 indicates that both subchronic and chronic RfDs were used to evaluate risk from noncarcinogens. On the other hand, the first full paragraph on page C.2-20 states that "exposures have been evaluated in all cases on a chronic basis, using chronic RfD values." The text of Appendix C should be revised to consistently and clearly describe how risks from noncarcinogens were evaluated.

Response: Agreed.

Action: The text of Appendix C (Section C.4-0) has been revised to consistently and clearly describe how noncarcinogenic health hazards were evaluated using chronic RfDs in the OU2 FS RA.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: C.2.2.2.3 Page #: C.2-24 Line #: 14 and 15 Code:
Original Specific Comment #: 22

Comment: These lines state that intake equations used to estimate risks (exposures) are described in the baseline risk assessment. These lines should be revised to indicate the sections of the baseline risk assessment in which the intake equations appear.

Response: Specific section of the Baseline Risk Assessment from the RI will be added to the text for reference.

Action: Because Appendix C has been extensively rewritten, this specific comment was addressed where appropriate.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: C.2.2.3 Page #: C.2-25 Line #: 15 Code:
Original Specific Comment #: 23

Comment: This line states that exposure point concentrations used to estimate intakes are PRGs. However, a comparison of subunit-specific estimate procedure PRGs and risk tables in Attachment III indicates that this is not used. For example, Table A.III-10 indicates that the soil PRG for cesium-137 (CS-137) for on-property farmer is 1.20E-02 picocurie per gram (pCi/g). On the other hand, Table A.III-33 presents an exposure point concentration for CS-137 used in exposure calculations for the on-property farmer of 7.02E-01 pCi/g. Appendix C should be revised to clearly explain and document which exposure point concentrations are used throughout Appendix C.

Response: Fate and transport modeling will be used for residual soil concentrations at PRG levels. Text will be revised to conform with this determination. The waste disposal cell, however, will use the waste acceptance criteria.

Action: Because Appendix C has been extensively rewritten, this specific comment was addressed where appropriate.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: C.3.1 Page #: C.3-2 Line #: 1 and 2 Code:
Original Specific Comment #: 24
Comment: The first sentence of the first paragraph states that for assessing short- and long-term risks, potential exposures to all chemicals of potential concern (CPC) were evaluated. However, the second sentence states that for assessing long-term risks, potential risks from identified COCs only were evaluated. The paragraph should be revised to resolve the discrepancy between these two sentences.
Response: Paragraph will be revised to read: For assessing short-term and long-term risk,, potential exposures to all COCs surviving the RI screening process will be addressed in the various media.
Action: Text has been revised in Section C.1.4.1.

Commenting Organization: U.S.EPA Commentor: Saric
Section #: C.3.3.2 Page #: C.3-3 Line #: 26 and 27 Code:
Original Comment #: 25
Comment: These lines state that there is "very little difference" between the alternatives in terms of risk of injury or fatality. However, the differences between alternatives is up to three times. This difference can not be considered "very little." The lines should be revised to present a conclusion that describes the extent of the differences between alternatives and lets the reader draw his or her own judgement.
Response: Text will be revised to present the risks of injury and fatality for each alternative. The term "very little" will be deleted.
Action: Because Appendix C has been extensively rewritten, this specific comment was addressed where appropriate.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: C.3.4 Page #: C.3-4 Line #: 22 and 23 Code:
Original Comment #: 26
Comment: These lines state that the carcinogenic risks to the expanded trespasser associated with remedial alternative (AFP5) (1.5E-05) are driven by dermal exposure to arsenic and external radiation exposure to thorium-228 (TH-228). This statement is not accurate. The risks are driven by inhalation exposure to arsenic (2.9E-06) and external radiation exposure to TH-228 (4.4E-06) and radium-228 (RA-226) (3.1E-06). The text should be revised to correctly summarize the risks.
Response: The revision of the alternatives will require the re-calculation of risks. As such, values in text and tables will all change and the integration of tables and text will be checked.
Action: Because Appendix C has been extensively rewritten, this specific comment was addressed where appropriate.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: C.3.4 Page #: C.3-5 Line #: 6 Code:
Original Comment #: 27
Comment: This line states that risks for all alternatives for the active flyash pile (AFP) are summarized in Tables C.3-13(a) and (b). This statement is not correct. Risks associated with remedial alternative AFP2 are not summarized in these two tables. The text should be revised to state where the risks associated with remedial alternative AFP2 are presented.
Response: The risks for all alternatives are currently being recalculated. As such, risk values will change and be integrated into the tables and text. Conclusions will be revised to reflect new risks.
Action: Because Appendix C has been extensively rewritten, this specific comment was addressed where appropriate.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: C.4.1 Page #: C.4-2 Line #: 2 to 4 Code:
Original Comment #: 28
Comment: The second sentence of the first incomplete paragraph states that for assessing short- and long-term risks, potential exposures to all CPCs were evaluated. On the other hand, the third sentence states that for assessing long-term risks, potential risks from identified CPCs only were evaluated. The paragraph should be revised to resolve the discrepancy between these two sentences.
Response: Text will be revised to read: For assessing short-term and long-term risk potential to all COCs surviving the RI screening process will be addressed.
Action: Because Appendix C has been extensively rewritten, this specific comment was addressed where appropriate.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: C.4.3.1 Page #: NA Line #: NA Code:
Original Comment #: 29
Comment: Table C.4-13(c) presents short-term risks associated with south field surface soil for the off-property farmer. However, the table presents only carcinogenic risks. The table should either be revised to also present noncarcinogenic risks or else explain why noncarcinogenic risks are not presented.
Response: A discussion of applicability of noncarcinogenic short-term risk will be added that is consistent with the RAWPA.
Action: Because Appendix C has been extensively rewritten, this specific comment was addressed where appropriate.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: C.4.4 Page #: C.4-4 Line #: 22 and 23 Code:
Original Comment #: 30
Comment: These lines introduce Tables C.4-18(a) through (d) and the risks presented in these tables. Table C.4-18(b) does not appear in the text or in Attachment II. Appendix C should be revised to include Table C.4-18(b).
Response: Text will be revised and the missing Table C.4-18(b) will be added with the revised risk calculations.
Action: Because Appendix C has been extensively rewritten, this specific comment was addressed where appropriate.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: C.5.2 Page #: C.5-2 Line #: 8 Code:
Original Comment #: 31
Comment: This line states that all remedial alternatives for the inactive flyash pile (IFP) include excavation of contaminated material. However, the description of remedial alternative IFP7 in Table C.5-2 does not include excavation of contaminated material. The text and Table C.5-2 should be revised to eliminate this discrepancy.
Response: Text will be revised to eliminate discrepancy and be consistent with revisions to the FS Section 4.0.
Action: Because Appendix C has been extensively rewritten, this specific comment was addressed where appropriate.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: C.5.3.1 Page #: NA Line #: NA Code:
Original Comment #: 32
Comment: Table C.5-11 presents the concentration of COCs in excavated material for each of the IFP alternatives. However, alternative IFP8 is not represented in this table. The table should be revised to include concentrations of COCs for alternative IFP8.
Response: Tables will be revised to reflect the current description of alternatives from Section 4.0 of the FS.
Action: Because Appendix C has been extensively rewritten, this specific comment was addressed where appropriate.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: C.5.3.2 Page #: C.5-4 Line #: 5 to 12 Code:
Original Comment #: 33
Comment: This paragraph summarizes transportation risks associated with the IFP. The alternatives are consistently mislabeled throughout the paragraph as either "AFP" or "FP" rather than as "IFP." The paragraph should be revised to correct these errors.
Response: In the revised description of the transportation risks, the alternatives and subunits will be accurately labeled and errors and omissions checked.
Action: Because Appendix C has been extensively rewritten, this specific comment was addressed where appropriate.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: C.5.4 Page #: NA Line #: NA Code:
Original Comment #: 34
Comment: Table C.5-19 is intended to summarize the long-term risks and hazards associated with the IFP. However, risks and hazards associated with the on-property farmer are not included in the table but are discussed in the text and presented in Attachment II, Tables C-5-18(a) thorough (c). Table C.5-19 should be revised to include risks and hazards associated with the on-property farmer.
Response: Risks and hazards to the on-property farmer will be included in the text and Table C.5-19 for long-term risks for the Private Land Use Scenario but would not be included under the Federal Land Use Scenario.
Action: Because Appendix C has been extensively rewritten, this specific comment was addressed where appropriate.

000049

Commenting Organization: U.S. EPA Commentor: Saric
Section #: C.5.4 Page #: C.5-5 Line #: 10 and 15 Code:
Original Comment #: 35
Comment: Line 10 states that Tables C.5-17(a) through (c) present risks to the on-property farmer. However, these tables present risks associated with the off-property farmer. Line 15 also states that Tables C.5-18(a) through (c) present risks associated with the off-property farmer. This statement is also incorrect. These tables present risks associated with the on-property farmer. These lines should be revised to correctly indicate the risks presented in Tables C.5-17(a) through (c) and C.5-18(a) through (c).
Response: Text reference to tables, and table headings will be corrected to reflect the land use scenarios, the receptors, the alternatives and the subunits.
Action: Because Appendix C has been extensively rewritten, this specific comment was addressed where appropriate.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: C.6.3.1 Page #: NA Line #: NA Code:
Original Comment #: 36
Comment: Table C.6-6 presents the concentrations of COCs in excavated material associated with the solid waste landfill (SWL). Several problems exist with the concentrations presented. First, the number of significant figures varies considerably, which is unlikely. The table should be revised to consistently present the concentrations with a consistent and reasonable number of significant figures (for example, it is unlikely that chromium was measured accurately as presented (20.489 mg/kg). This comment also applies to similar tables prepared for the other subunits. Second, the concentration of benzo(a)anthracene is presented as O. This value is not acceptable. Analytical limitations preclude the determination that a contaminant is present at a concentration of 0. The table should be revised to replace 0 with an appropriate substitute such as not detected (ND) or less than (<) some specified value.
Response: Table C.6-6 and other similar tables will be checked and revised to reflect appropriate significant figures based on the accuracy of the reported values. Zeroes (0) will be replaced with either ND or (L) from information available in the OU2 RI Report.
Action: Appendix C has been revised accordingly.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Attachment I Page #: NA Line #: NA Code:
Original Comment #: 37
Comment: Minor errors are present throughout the attachment in the values presented for total crew labor hours. For example, in Table C.3-3 under the second task, the total crew labor hours is presented as 13,620. However, a value of 14,080 hours was calculated based on the product of exposure duration, total crew, and maximum anticipated exposure. The attachment should be reviewed and any errors corrected.
Response: Errors and inconsistencies with regard to labor hour estimates will be checked and revised in the text, Table C.3-3, and the attachment.
Action: Appendix C has been revised as required.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: Attachment III Page #: NA Line #: NA Code:
Original Comment #: 38

Comment: The title of this attachment is "Derivation of Preliminary Remediation Goals." However, the attachment presents not only the derivation of PRGs but also numerous risk tables. The title should be revised to more accurately represent the material presented in this attachment.

Response: The title of the attachment will reflect the "Derivation of Preliminary Remediation Goals, and Supporting Risk Calculations."

Action: Because Appendix C has been extensively rewritten, this specific comment was addressed where appropriate.

APPENDIX D

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.1.1.2 Page #: D-1-7 Line #: NA Code:
Original Comment #: 39

Comment: The text should provide a brief summary describing the modeling effort. The summary should incorporate all the subunits into one scenario to reflect actual, natural conditions. The summary should include information about source development, contaminant pathways and controls, and degradation of contaminants as they move towards the Great Miami Aquifer (GMA) and then towards the fence line. This summary would be helpful because of the difficulty in providing model input and output data due to its size.

Response: ECTran model was used as a screening tool. Final PRGs are developed using more complex models ODAST (SWIFTLOAD) and SWIFT. Therefore, Appendix D-1 will be eliminated in the final FS and all PRG developments will now be shown in original Appendix D-3.

Action: None. Elimination of current text in Appendix D-1 will eliminate need for additional text.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.1.1.2 Page #: D-1-7 Line #: NA Code:
Original Comment #: 40

Comment: The text discusses modified soil PRGs that are protective of perched groundwater; however, perched groundwater PRGs are only discussed for the SWL. Perched groundwater conditions are also identified for other subunits in OU2, such as the IFP, but are not discussed even though perched groundwater is the shortest exposure route evaluated in the risk assessment. The text should be revised to provide a discussion of perched groundwater PRGs for other subunits or explain why they are not presented.

Response: See response to original general comment #20.

Action: See action to original general comment #20.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.1.1.3 Page #: D-1-15 Line #: 36 to 40 Code:
Original Comment #: 41

Comment: The text discusses the calculation of soil PRGs that are protective of the GMA. The text should state if the soil PRGs that are protective of the GMA are above health-based levels for soil exposure.

Response: Comparison of cross-media PRGs and health based PRGs for direct contact with soils are discussed in Section 2 and only modeling is presented in Appendix D in the revised FS.

Action: Section 2 has been revised to provide clearer development of PRGs culminating in selection of PRLs based on PRG comparisons.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.1.2.4 Page #: D-1-21 Line #: 17 to 20 Code:
Original Comment #: 42

Comment: The text states that technetium-99 (Tc-99) and carbazole have not been detected in the perched groundwater beneath the site. However, Table A.2-49 in the OU2 RI report states that based on modeling results, the minimum arrival time to the GMA for Tc-99 is 10 to 20 years. The Tc-99 arrival time is therefore within the present-day time interval of 40 years, implying that Tc-99 is present in the perched groundwater. The text should resolve the discrepancy concerning the arrival of Tc-99 to perched groundwater.

Response: Modeling is done on very conservative assumptions. For example, it applies 95% UCL concentrations for all source area. Therefore, model may be overpredicting Tc-99 concentration since it was not detected in any samples from the perched water. Furthermore, Tc-99 does not adsorb; thus, there is a possibility that most of Tc-99 may have leached out and already reached to the GMA where it is not detected due to dilution.

Action: None.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.1.3.1 Page #: D-1-26 Line #: 2 to 5 Code:
Original Comment #: 43

Comment: The text in this and following sections discusses vertical infiltration downgradient of waste subunits in OU2. The infiltration was incorporated into the ECTran model by increasing the effective decay rate in the downgradient area. The text should explain how the increase in the effective decay rate was calculated and what the effective decay rate is for the contaminants modeled in each subunit.

Response: See response to comment 39.

Action: See action for comment 39.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.1.3.3 Page #: D-1-31 Line #: 3 to 5 Code:
Original Comment #: 44

Comment: The text states that the hydraulic gradient and flow distance along the path line from the IFP to the fence line were calculated using groundwater contour data from 2000-series monitoring wells for April 1988 to December 1989. Data from this time interval was collected during a drought and may not represent actual conditions. The text should be revised to use present day or most recent groundwater data for all subunits in OU2.

Response: This text is included in Appendix D.1 of the April FS in the section on ECTran modeling for screening purposes. As noted in USEPA Original Comment #39 above, the screening modeling has been eliminated in the revised FS and the text which drew the comment no longer exists.

Action: None other than the replacement of Appendix D.1 of the April FS.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.2.2.3 Page #: D-2-4 Line #: NA Code:
Original Comment #: 45

Comment: The text discusses ECTran modeling results for the consolidation/containment remedial scenario. The model results for groundwater beneath the remediation site are compared to maximum contaminant levels (MCL), but the model results at the fence line are compared to health-based risk levels. The text should be revised to state why these results are compared to two different criteria.

Response: Model results for groundwater beneath the remediation sites are compared to MCL as per NCP requirements that concentration should not exceed MCLs at the point of compliance at the edge of subunit.

Action: The logic for this is presented in the risk-based PRG and ARAR portions of Section 2 and the comparison is carried throughout the PRG tables in Section 2.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.2.3.3 Page #: D-2-9 Line #: NA Code:
Original Comment #: 46

Comment: The text discusses the fate and transport modeling results of the consolidation/containment remediation scenario. It is not apparent if the horizontal and vertical modeling results for this scenario were combined to present realistic conditions beneath the scenario site. The text should either be revised to present the results of the modeling in a combined scenario or else state that the horizontal and vertical modeling were combined to reflect realistic conditions beneath the site.

Response: Horizontal migration followed by vertical infiltration was modeled to reflect realistic conditions beneath the site.

Action: Horizontal migration considerations apply to the Inactive Flyash Pile/South Field. Tables D.1-15 and D.1-23 present resultant PRG without and with the cap, respectively.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.3.2.3 Page #: D-3-9 Line #: NA Code:
Original Comment #: 47

Comment: The text states that the vertical hydraulic conductivity (K_v) values for the GMA were obtained by dividing the horizontal hydraulic conductivity (K_h) by 10. The text also states "vertical to horizontal hydraulic conductivity values for the GMA calculated from the South Plume pump test ranged from 0.07 to 10.7 (i.e., over a range which includes this value)." The value of 10 used to determine K_v from K_h is near the high end of the range determined from the South Plume pump test. The text should explain why the value of 10 was used to determine K_v from K_h for the GMA.

Response: The "10.7" in line 10 of page D-3-9 should read "0.17". The K_v was obtained by dividing K_h by 10. In other words, the ratio K_v/K_h used was 0.1. This is within the observed range of 0.07 to 0.17 for the same ratio.

Action: Text was corrected for the typo (see p. D-1-16).

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.3.3.3 Page #: D-3-14 and 3-15 Line #: NA Code:
Original Comment #: 48

Comment: The text discusses the original Sandia Waste Isolation Flow and Transport (SWIFT) model and its calibration to data from 1988 through 1990. The model has been subsequently modified and recalibrated. The text should be revised to restate the time interval of data used to recalibrate the SWIFT model.

Response: The line 1 of page D-3-16 states that monitoring data from 1990 to 1993 time period were used for calibration of the improved model.

Action: None.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.3.4.1 Page #: D-3-17 Line #: 5 and 6 Code:
Original Comment #: 49

Comment: The text states that for the SWL infiltration is controlled by the remediation cap and glacial overburden properties have negligible influence on the infiltration rate. The depth to which this infiltration rate applies is unclear. The text should be revised to indicate the depth to which this infiltration rate is applied and to explain how the glacial overburden properties do not affect the infiltration rate.

Response: Hydraulic conductivity of the glacial overburden is 1.9×10^{-6} cm/sec (23.6 inches/year). If water is available, under gravity drainage alone an infiltration rate of 23.6 inches/year can be sustained. However, infiltration through the cap is only 1.14 inch/year and is the limiting factor. Therefore, infiltration rate from surface to the Great Miami Aquifer is controlled by the infiltration through the cap and is applicable for all the vadose zone under the cap.

Action: Text was modified to read "Infiltration is controlled by the cap, and glacial overburden properties have negligible influence on the infiltration rate."

Commenting Organization: U.S. EPA Commentor: Saric
Section #: D.3.4.4.1 Page #: D-3-26 Line #: NA Code:
Original Comment #: 50

Comment: The text discusses the SWIFT modeling for the IFP and South Field. The vadose zone model pathway and the perched groundwater subsurface seep pathway are discussed, but information for the vadose zone pathway is not presented. The text should be revised to provide vadose zone pathway information.

Response: Migration of contaminants from the waste unit laterally and vertically through the vadose zone was designated as the vadose zone pathway.

Action: Information on the vadose zone pathway is provided in D.1.2 (page D-1-7) and specifically for the Inactive Flyash Pile and South Field in D.1.5.3.

APPENDIX I

Commenting Organization: U.S. EPA Commentor: Saric
Section #: I.1.3.1 Page #: I-1-7 Line #: 4 and 7 Code:
Original Comment #: 51

Comment: These lines present a range of average monthly wind speeds from National Weather Service (NWS) meteorologic data collected at the Greater Cincinnati Airport and compare them to on-site data. However, the on-site annual mean wind speed of 4.5 miles per hour (mph) is well below the NWS monthly average range of 7 to 11 mph. The report should discuss this apparent discrepancy.

Response: The wind speed data collected at the NWS Station at the airport in Kentucky and the wind speed data collected at the FEMP are miles apart and located in relatively different terrain. The data compare only as typical ranges in that general area and at the specific site in question. There is no discrepancies among the data since wind speed data from location to location would not necessarily "match".

Action: No action the reader is referred to the SWCR for a longer discussion of winds.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: I.3.1 Page #: I-3-2 Line #: 13 Code:
Original Comment #: 52

Comment: This lines states that an MCL of 4 millirems per year for beta- and gamma-emitters was interpreted to also apply to alpha emitters. The report should include specific references for this assumption.

Response: This line of text is a hold over from a previous version and is no longer used in a quantitative analysis, as such, the line will be deleted. For posterity, the reference to the 4 mrem/year is 40 CFR Part 141.16.

Action: The line of text has been deleted from Section 1.3.1 (p. I-3-1)

Commenting Organization: U.S. EPA Commentor: Saric
Section #: I.3.2.1 Page #: I-3-4 Line #: 5 Code:
Original Comment #: 53

Comment: This line states that residual soil concentrations of uranium 238 (U-238) and RA-226 were assumed to be 60 and 5 pCi/g, respectively. However, the report does not specify the reason for assuming these values. The report should specify why these values were used.

Response: The 60 pCi/g for U-238, and the 5 pCi/g for Ra-226 refer back to PRGS calculated for the expanded trespasser in the SWCR Part III.

Action: Text has been added in Section I.3.2.1 (p. I-3-3 & I-3-4) to develop justification of the PRGs.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: I.3.2.2 Page #: I-3-6 Line #: 11 Code:
Original Comment #: 54

Comment: This line states that meteorological data for 1990 was excluded because the collection efficiency for that year was below 90 percent. The report does not explain how this fact justifies its exclusion. The text should include such an explanation.

Response: The use of professional judgement for adequacy of data was used. By missing more than 10% of the meteorological data the potential for substantial shifts in cumulative frequencies of wind speed/direction is encountered. A "rule of thumb" for operating

state and local air monitoring networks (SLAMS) indicates that a data loss for meteorological systems of 10% or greater is significant. Further inquires to USEPA will be pursued to document this professional judgement.

Action: Meteorological data in CERCLA/EPA QA process has been documented in Section I.3.2 (p. I-3-6).

Commenting Organization: U.S. EPA Commentor: Saric
Section #: I.4.3 Page #: I-4-2 Line #: 8 Code:
Original Comment #: 55

Comment: This line states that COCs will be eliminated if they are nontoxic and ubiquitous, and Table I.4-1 lists COCs eliminated for this reason. However, two of the eliminated COCs, aluminum and iron, may have provisional toxicity factors established by U.S. EPA. The report should be revised to include these COCs if such provisional toxicity factors exist. In addition, COCs should not include nontoxic or ubiquitous constituents that are not of concern at a site. The text should be revised to change "COC" to "CPC."

Response: US EPA requested that aluminum and iron be included as COCs if provisional toxicity factors have been established by US EPA. The July 1994 IRIS and the 1993 HEAST do not appear to have toxicity factors for aluminum and iron.

Action: Text has been revised to delete aluminum and iron in Section I.4.2 (Table I.4-1, p. I-4-4). CPCs are addressed in Section I.4.1 (p. I-4-1).

Commenting Organization: U.S. EPA Commentor: Saric
Section #: I.4.3 Page #: I-4-4 Line #: NA Code:
Original Comment #: 56

Comment: Table I.4-2 lists the COC 1,1-dichloroethane (1,1-DCA) twice. It is not clear whether the entry for 1,1,-DCA is simply repeated or whether its repetition displaces another COC from the table. The table should be revised to eliminate the duplicate entry of 1,1-DCA.

Response: Duplicate entry will be deleted.

Action: Text has been deleted from Section I.4.2..1 (Table I.4-2, p. I-4-5).

Commenting Organization: U.S. EPA Commentor: Saric
Section #: I.6.2.2 Page #: I-6-64 Line #: NA Code:
Original Comment #: 57

Comment: This section states that 531 source areas are evaluated in 29 source groups. The method used to group these source areas should be given. Also, Figure I.6.22 is stated as showing these source group locations. These source groups are difficult to identify in this figure. Multiple figures may be required to adequately show these source groups.

Response: Additional text will be added and the figure modified to further justify and clarify the grouped sources for air modeling.

Action: Text and figure have been revised.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: I.6.2.4 Page #: I-6-64 Line #: NA Code:
Original Comment #: 58
Comment: This section states that emission rates for particulate matter less than 10 micrometers in diameter (PM_{10}) were used to evaluate particulate emissions only. This method is generally acceptable to evaluate risk from respirable particles in the inhalation pathway. The text should note, possibly in an uncertainty discussion, that larger particles may also suspend. Risks from other pathways such as ingestion or dermal exposure should not use data from estimated PM_{10} particle concentrations in air but should use total suspended particulates data instead.
Response: Text will be added to the uncertainty analysis (Section I.10) to distinguish the implications of respirable particulates (less than 10m) from total suspended particulate.
Action: Text has been added in Section (I.10.5.1 (p.I-10-12 & I-10-14).

Commenting Organization: U.S. EPA Commentor: Saric
Section #: I.6.2.4.2 Page #: I-6-86 Line #: 11 through 19 Code:
Original Comment #: 59
Comment: This paragraph discusses how the use of a single dispersion emission rate for six wind speed categories used in the Industrial Source Complex Dispersion Model, Long-Term, Version 2 (ISCLT2), may over- or underestimate concentrations. This type of discussion should be consolidated into an uncertainty section that discusses all sources of uncertainty, states whether the uncertainty potentially over- or underestimates the true air concentration, and provides an order-of-magnitude estimate on the uncertainty.
Response: Further text will be added to the uncertainty analysis (Section 10) to present the balance of over/under estimating potentials from air emissions and subsequent dispersion modeling.
Action: Text has been added in Section I.10.5.1 (p.I-10-12 to I-10-14).

Commenting Organization: U.S. EPA Commentor: Saric
Section #: I.7.5.1 Page #: I-7-15 Line #: 17 Code:
Original Comment #: 60
Comment: The text notes that cesium hydroxide is much more acutely toxic than the cesium halides. This effect is probably due to the corrosivity of cesium hydroxide and is unrelated to the cesium itself. The text should be revised to include this fact.
Response: The comment concerning cesium hydroxide will be addressed by deleting the reference to cesium hydroxide.
Action: The sentence referring to cesium hydroxide has been deleted from the text in Section I.7.5.1 (p. I-7-15).

Commenting Organization: U.S. EPA Commentor: Saric
Section #: I.7.5.2 Page #: I-7-16 Line #: 5 Code:
Original Comment #: 61
Comment: The text should include a reference to Section I.7.6.17 for the discussion of the noncarcinogenic toxicity of lead-210.
Response: Agreed.
Action: The text has been revised in Section I.7.5.2 (p.I-7-16) to reference Section I.7.6.17 for a discussion of the noncarcinogenic toxicity of lead.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: I.7.5.3 Page #: I-7-16 Line #: 14 Code:
Original Comment #: 62
Comment: The text states that neptunium-237 is usually produced by "(n,2n) and (n,8) nuclear reactions." The former reaction is correct, but ""(n,8)" is incorrect. The text probably means that the second source is the alpha decay of americium-241. The source of this information should be checked (its source should be cited in text) and corrected.
Response: The phrase "via the (n,2n) and (n,8) nuclear reactions with uranium" is not central to this toxicity profile and will be deleted.
Action: The text has been revised in Section I.7.5.3 to read: "Np-237 has a half-life of 2.14×10^6 years and is primarily produced in nuclear reactors."

Commenting Organization: U.S. EPA Commentor: Saric
Section #: I.7.5.3 Page #: I-7-17 Line #: 7 Code:
Original Comment #: 63
Comment: This line discusses the noncarcinogenic toxic effects of neptunium-237 but not the radiation effects. The text should discuss these radiation effects.
Response: The radiation effects of neptunium-237 are discussed on lines 21-25.
Action: The final sentence of this paragraph in Section I.7.5.3 (p.I-7-17) has been revised to read: "Therefore, health effects are assessed only with respect to carcinogenicity, which is discussed in the next section."

Commenting Organization: U.S. EPA Commentor: Saric
Section #: I.7.5.12 Page #: I-7-38 Line #: 27 Code:
Original Comment #: 64
Comment: This line discusses biological studies with uranium-233. This unnatural isotope is quite difficult to prepare in the laboratory. U.S. EPA is unaware of any biological studies that have been conducted using this isotope. Therefore, the reference should be checked and the text corrected, if necessary. This same comment also applies to "uranium-232 and uranium-233" in Lines 16 and 21 of Page I-7-39.
Response: The reference will be checked and the text corrected, if necessary.
Action: No action is required.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: I.7.6.1 Page #: I-7-40 Line #: NA Code:
Original Comment #: 65
Comment: Most of the discussion presented for 4,4'-dichlorodiphenyldichloroethene (DDE) is actually specific to 4,4'-dichlorodiphenyltrichloroethane (DDT). The text should note in the introduction to this section that the two chemicals have practically equal biological effects and that 4,4'-DDT is generally used as a surrogate for its much less studied metabolite, 4,4'-DDE.
Response: Agreed.
Action: The following text has been added in Section I.7.6.13 (p.I-7-48). "Since DDT and DDE have practically equal biological effects, DDT is generally used as a surrogate for the much less studied 4,4-DDE.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: I.7.6.16 Page #: I-7-55 Line #: 2 Code:
Original Comment #: 66
Comment: This line suddenly introduces the heterocyclic hydrocarbon dibenzofuran, which is biologically unrelated to the polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans discussed in the remainder of the section. This irrelevant sentence should be deleted or expanded in a separate section discussing dibenzofuran.
Response: As suggested, the indicated sentence will be deleted.
Action: The indicated sentence has been deleted from Section I.7.6.16 (p.I-7-52).

Commenting Organization: U.S. EPA Commentor: Saric
Section #: I.7.6.15 Page #: I-7-56 Line #: NA Code:
Original Comment #: 67
Comment: The lower half of Table I.7-5 contains numerous references to "dibenzo-para-furans." It is impossible to have such a structure as part of a five-membered furan ring. This chemical nomenclature should be corrected.
Response: Agreed.
Action: The chemical nomenclature has been corrected in Section I.7.6.15(Table I.7-6 p. I-7-53)..

Commenting Organization: U.S. EPA Commentor: Saric
Section #: I.8.2 Page #: I-8-1 Line #: 23 and 24 Code:
Original Comment #: 68
Comment: The values presented in these lines are in units of milligram per liter and liter per day, indicating that Equation 1 calculates the chronic daily intake (CDI) of COCs in water. No equation is presented for the estimation of CDI of COCs in soil or sediment. Equation 1 should either be modified to estimate the CDIs of COCs in water, soil, or sediment, or else a separate equation should be presented for estimating the CDI of COCs in soil or sediment. Also, all equations should be specifically labeled to refer to the parameter calculated.
Response: The equation will be modified and all equations will be labeled to refer to the parameter calculated.
Action: Equation 1 has been revised in Section I.8.2 (p. I-8-1).

Commenting Organization: U.S. EPA Commentor: Saric
Section #: I.8.3 Page #: I-8-8 Line #: NA Code:
Original Comment #: 69
Comment: Table I.8-2 lists soil absorption coefficients for dioxins/furans and PCBs and references their source. However, the table should note that these values are presented in the cited reference (EPA 1992) as substitute values. The value presented for dioxins/furans is actually a value for trichlorodibenzo-p-dioxin, and the value presented for PCBs is actually a value for trichlorobenzene.
Response: Agreed.
Action: The table footnote will be clarified in Section I.8.3, p. I-8-15) to indicate that the measured uptakes for 3,3', 4,4'-tetrachlorobiphenyl (TCB) has been applied to all polychlorinated biphenyls and that the measured uptake for 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) has been applied to all polychlorinated dibenzo-p-dioxins and polychlorinated dibenzofurans.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: I.11.1.2 Page #: I-11-2 Line #: 3 to 6 Code:
Original Comment #: 70
Comment: These lines discuss COCs that are of "major" concern or are "principle" contributors to risk. However, it is not clear if these COCs include all the chemicals that contribute significant risk. The report should be revised to specify which COCs contribute significant risk.
Response: Text will be revised to distinguish major COCs contribute the majority of risk to individual receptors.
Action: Text has been revised in Section I.11.1.2 (p.I-11-2).

Commenting Organization: U.S. EPA Commentor: Saric
Section #: I.11.1.3 Page #: I-11-2 - I-11-3 Line #: 23-28; 1-2 Code:
Original Comment #: 71
Comment: These lines discuss risks to various receptors and state that some are "above the target range" or "above the noncarcinogenic hazard index (HI) benchmark of 1." However, the text does not specify the degree to which the risks exceed the target range or benchmark value. The text should be revised to state the actual risk estimated for each receptor exceeding the target range or benchmark value.
Response: Agreed
Action: The text has been revised in Section I.11.1.3 (p.I-11-2 & I-11-3) to indicate which receptor exceeds the target range or benchmark value.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: I.11.2 Page #: I-11-9 Line #: 21 Code:
Original Comment #: 72
Comment: This line mentions risk to the trespassing child under a future land use scenario. However, Table I.11-2 lists the trespassing child only under the current land use scenario. The report should be revised to eliminate this inconsistency.
Response: Since the trespassing child receptor was within the ILCR target risk range and below the HI=1 it was mentioned in Table I.11-1 but is not carried forward to Table I.11-2 as impacted. As such, it is still in viable reception.
Action: No action is required.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: I.11.3 Page #: I-11-13 Line #: 1 Code:
Original Comment #: 73
Comment: This line states that no major uncertainties affect the selection of COCs. This statement fails to recognize that the proposed COC screening criteria involve modeling that contains a large degree of uncertainty. The text should be revised to discuss the uncertainty involved with COC screening.
Response: The degree of uncertainty associated with the COC screening criteria will be described.
Action: Text has been added in Section I.11.3 (p.I-11-13) to clarify the COC screening criteria and discuss the uncertainty associated with the COC screening.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: I.11..3 Page #: I-11-13 Line #: 3 Code:
Original Comment #: 74
Comment: This line discusses the likely overestimation of risk resulting from conservative RfDs and slope factors. However, the text does not discuss the potential underestimation of risk resulting from the failure to quantify risk from (1) COCs for which no toxicity factors are available and (2) tentatively identified compounds. The text should be revised to discuss these additional uncertainties.
Response: Text will be revised to discuss the uncertainties associated with COCs that have no toxicity factors, and TICs.
Action: Text has been revised in Section I.11.3 (p.I-11-13).

Commenting Organization: U.S. EPA Commentor: Saric
Section #: I.11.3 Page #: I-11-13 Line #: 10 Code:
Original Comment #: 75
Comment: This line states that "preliminary calculations" have indicated that the fugitive emissions model may be overestimating emissions. The report should clarify what is meant by "preliminary calculations" and how the model may be shown to overestimate emissions unless actual measured values are available for comparison.
Response: EPA frequently test predictive emission and dispersion models against measured against real-time situations. For example EPA in the Guidance on Air Quality Models qualifies that the ISCLT model does not over predict by more than a factor of 2. Existing information on models used will be verified and incorporated into the uncertainty analysis (Section I.10).
Action: Add new text.

Commenting Organization: U.S. EPA Commentor: Saric
Section #: I.13.0 Page #: I-13-41 Line #: 20 Code:
Original Comment #: 76
Comment: This line references "Air/Superfund National Technical Guidance Series, Volume III, EPA, 1985." However, no document with this title and date has been identified. This reference should be reviewed to determine if the wrong date is listed. The earliest identified publication of the Air/Superfund National Technical Guidance Series was published in 1989.
Response: The confusion over this reference deals with an incorporation by reference on Page 164 of Volume III of the Air Superfund National Technical Guidance. On that page the chemical 6 model and the Superfund Exposure Assessment Manual are both incorporated by reference. These 1985 documents provide a basis for the volatile loss concept. Within Volume II Page 29 of the Air Superfund National Technical Guidance 1989 the actual terms, volatile, semivolatile, and, non volatile are presented.
Action: Clarify reference concept, and method used in text.

RESPONSE TO OHIO EPA COMMENTS

RESPONSE TO OEPA COMMENTS ON THE DRAFT FEASIBILITY STUDY (FS) REPORT AND PROPOSED PLAN (PP) FOR OPERABLE UNIT 2 (OU2)

Commenting Organization: Ohio EPA Commentor: OFFO
Original Comment #: 1
Comment: DOE must incorporate an off-site disposal at a commercial facility option as was included in the OU1 and OU4 FSs. The alternative should use Envirocare or a similar facility to obtain representative costs. This alternative must be fully evaluated within the FS.
Response: Agreed.
Action: A commercial off-site disposal facility (using EnviroCare for representative costs and waste acceptance criteria) has been incorporated into the revised FS. A representative commercial off-site disposal alternative is carried through detailed analysis and comparative analysis in Sections 5 and 6, respectively.

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: General Comment Page #: Line #: Code: G
Original Comment #: 2
Comment: Ohio EPA does not agree with DOE's assertion that waste from OU2 could be considered as "Exempt Waste" under Ohio's solid waste laws. Ohio EPA commented on this issue on the OU2 RI. The disposal activities which occurred in all OU2 areas do not support the exempt waste designation. The commingling of wastes including organic and radiological contaminants within these areas eliminates the classification of these wastes as exempt.
Response: Although DOE believes that the argument could be made to consider some OU2 waste as Exempted Waste, the classification was originally included for alternatives that would separate the flyash or lime sludge from other wastes. Since none of the current alternatives propose segregating flyash or lime sludge, this classification will be removed.
Action: The discussion of Exempted Waste has been removed from Section 2 and from Appendix B. The waste that was classified as "exempt" is now considered solid waste throughout the FS.

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: General Comment Page #: Line #: Code: G
Original Comment #: 3
Comment: DOE should include within the long-term protectiveness criteria of the detailed analysis of alternatives a discussion of the alternatives ability to be protective of the Great Miami Aquifer at the waste unit boundaries for both existing units and any created disposal cells. The proposed alternatives must be protective of the GMA for it maximum beneficial use at the waste management unit boundary (i.e., protective for residential usage).
Response: Agreed.
Action: Tables have been added which present the maximum expected cross-media uranium concentrations at the subunit boundaries for each of the alternatives undergoing detailed evaluation. Those tables are in the subsections on compliance with ARARs (see Tables 5-4, 5-8, and 5-11.

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: General Comment Page #: Line #: Code: G
Original Comment #: 4

Comment: The document fails to justify remediating to different PRGs under different alternatives. This format makes it impossible to compare the effectiveness, cost, etc. of the different alternatives. The resulting comparison is apples to oranges. DOE should revise the alternatives to remediate to a consistent level thus allowing for the most equitable evaluation of the alternatives and selection of the best alternative.

Response: Agree that the alternatives should reflect a consistent remediation level to allow an equitable evaluation.

Action: A clear set of Remedial Action Objectives (RAOs) has been presented in the revised version of Section 2.0. These RAOs are related to PRLs to be protective of the appropriate receptors. Four sets of PRLs have been presented in the summary of Section 2.0:

1. Private ownership
2. Federal ownership
3. Federal ownership with lateral perched water control
4. Federal ownership with lateral perched water and infiltration controls

The evaluation of alternatives in Sections 4.0 and 5.0 will be based on one land-use scenario (Federal ownership) and one target risk level (10^{-6}). While this utilized three different sets of PRLs (due to source controls), the alternatives all address the same receptors at the same level of risk, and thus a direct comparison among alternatives can be made. The presentation of each alternative includes a brief discussion of future land use under private ownership and significant difference from the federal control scenario are noted. Estimates of volume and cost for both land-use scenarios at both the 10^{-5} and 10^{-6} target risk levels have been provided in Appendices E.1 and F.8, respectively.

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: General Comment Page #: Line #: Code: M
Original Comment #: 5

Comment: There is no provision in the proposed remedy to segregate extraordinarily contaminated materials that might be encountered during excavation activities in the K-65 trench, flyash pile areas, or South Field. Can field instruments be used to identify "hot spots" (that occupy a small volume but contain a large contaminant mass) during the excavation process at reasonable costs? If so, why not treat/dispose of such materials differently (e.g., dispose with materials excavated from OU1)?

Response: Any material which is identified to exceed waste acceptance criteria (WAC) for on-site disposal will be treated or disposed off-site. Complete field screening of the 300,000 to 800,000 cubic yards to be excavated under some of the OU2 alternatives, could become quite expensive. However, the need for field screening to identify "hot spots" is driven by the likelihood of finding material that exceeds the WAC for on-site disposal. The proposed WAC for uranium (see Appendix E.2) is high compared to the typical concentrations uranium measured in the Operable Unit 2 subunits. After the excavation of regions known to exceed the preliminary WAC, confirmation sampling would be

appropriate. Contaminant levels known to be at or above the WAC would justify a more thorough field screening and confirmation sampling program. The revised FS indicates that limited amounts of material are likely to require treatment or

Action: In the revised FS, the Section 5.5.1.2.1 was written to present the proposed field screening procedures, and Appendix E.2 was added to present waste acceptance criteria.

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: General Comment Page #: Line #: Code: M
Original Comment #: 6

Comment: A drainage layer below the excavated fill that is tied into the interceptor trench system should be designed/considered for the Inactive Flyash Pile/South Field/Active Flyash Pile consolidation-containment cell. Leachate could be pumped directly from a sump prior to tie-in with the interceptor drain, or from the perimeter drain. With proper design, such a drainage layer will: (1) allow monitoring of leachate generation rates (infiltration to the cell) and leachate quality; and (2) ensure that leachate does not migration laterally or vertically beyond the hydraulic control of the interceptor trench drain. Based on cost estimates given for the On site Disposal facility, it appears that an effective drainage layer would not greatly increase the overall remedial cost.

Response: Agreed. A drainage layer below the relocated material could enhance effectiveness of consolidation and capping in the South Field vicinity. That drainage layer would be constructed on top of the existing material in the consolidation area. Excavated material would be placed on the drainage layer and the capping system would be constructed over the excavated material.

Action: The consolidation and capping alternative in the revised FS includes a drainage layer (see subsections 5.3.1 and 5.3.1.7). This drainage layer is also indicated in Figures 5-4 and 5-10.

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: ES Page #: ES-8 Line #: 19 Code: E
Original Comment #: 7

Comment: Uranium-234 is listed twice.

Response: Agreed.

Action: None. During revision of the Executive Summary, the paragraph containing this error was deleted.

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 1.6.1.1 Page #: 1-47 Line #: 1 Code: C
Original Comment #: 8

Comment: The document states that "some apparent process wastes have been placed in the landfill." Describe what is meant by process wastes.

Response: Disposal of "process wastes" cannot be verified.

Action: Reference to process waste has been deleted.

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 1.6.2.1 Page #: 1-51 Line #: 4 Code: C
Original Comment #: 9
Comment: Are there any known contaminants in the waste stream from the coal pile storm water runoff collected from the coal pile?
Response: Limited water quality data from the coal pile runoff is available from a sampling event in August 1991 that did not detect elevated organics or EP tox metals. Since coal pile stormwater runoff might have been expected to contain elevated concentrations of PAHs or metals, analyses for these were completed on the Lime Sludge. None of these constituents were found to be a problem in the baseline risk assessment, and historical chemical quality of the coal pile stormwater runoff has not been considered a concern for Operable Unit 2.
Action: None.

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: Figure 1-17 Page #: 1-53 Line #: Code: C
Original Comment #: 10
Comment: In this and subsequent figures in the text, there is a layer represented that is not included in the legend. This omission occurs several times in the remainder of the text.
Response: The legend for the layer will be made to match the figure.
Action: The figures were revised so that the symbol for "Sand and Gravel" in the legend matched the layer in the cross-section.

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 1.6.3.1 Page #: 1-55 Line #: 5 Code: C
Original Comment #: 11
Comment: The text states that asbestos containing transite is visible at the surface in the Inactive Flyash Pile. The FEMP does not indicate if any action has been taken or is anticipated to eliminate this hazard. If exposed, the asbestos can easily become airborne and pose a health hazard. Steps should be taken as soon as possible to alleviate this hazard.
Response: Asbestos is chemically bonded to the matrix of the siding material and is exposed in small quantities within the eroded section of the Inactive Flyash Pile. This is not believed to constitute an airborne asbestos hazard. The entire area is currently fenced to present unauthorized access.
Action: None.

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 1.7.1.1 Page #: 1-90 Line #: 14 Code: C
Original Comment #: 12
Comment: During Phase I, an incomplete surface water sample was collected in which two semivolatile compounds were detected. Why was this sample incomplete and does the fact that it is incomplete effect the validity of the results? Was another sample collected in its place?

000067

Response: The sample did not have complete suite of analytes collected. Results from a surface water sample collected during Phase I are not representative of current conditions and were not used in the RI or FS. Samples were collected during the Phase II field program, and their data are reported in the FS.

Action: None.

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 1.7.1.3 Page #: 1-127 Line #: 15 Code: C
Original Comment #: 13

Comment: Well No. 1016 is described as mislabeled. Will the fact that the well is mislabeled cause any sampling confusion? The well should be relabeled as soon as possible.

Response: The new well number is 21190 and was assigned on June 15, 1993. All existing data in the site-wide database were placed in the revised well record.

Action: The text has been revised to indicate the new well number.

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 2.2.1.4 Page #: 2-8 Line #: 18 Code: C
Original Comment #: 14

Comment: DOE Orders 5400.5 and 5820.2A provide different dose levels for the protection of the general public. NESHAPS again provides a different level of protection. How will the FEMP incorporate these three different dose levels? Will one, two or a combination of all three levels be used?

Response: The dose levels provided in each of the three cited requirements are specified for three types of exposures. Specifically:

- NESHAP requires that members of the public do not receive an effective dose of 10 mrem per year from airborne radionuclide emissions.
- DOE Order 5400.5 states that exposure of members of the public to radiation sources shall not cause an effective dose equivalent greater than 100 mrem/year.
- DOE Order 5820.2A is for concentrations of radioactive material released to the general environment in groundwater, surface water, air, soil, plants or animals must not result in an annual dose to any member of the public exceeding 25 mrem.

Based on the type of exposure scenario, any of the three ARARs would be required. NESHAP and DOE Order 5820.2A would be for the protection of the off-property members of the public or the on-property farmer if the area is no longer under federal control. DOE Order 5400.5 would also be ARAR if waste is maintained on-site and members are allowed access as represented by the expanded trespasser where direct radiation could also occur.

Action: An explanation of these different levels has been added to the end of Section 2.3.1.4.

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: Table 2-2 Page #: 2-11 Line #: Code: C
Original Comment #: 15
Comment: The Inactive Flyash Pile is listed as containing exempt waste. An earlier description of the waste in the unit states that other waste were also disposed of in the flyash pile. If any other waste was included with the flyash, a claim of exempt waste can not be made. Therefore, the table and any other references to exempt waste should be corrected.
Response: The inclusion of the Ohio exempt waste classification was originally included for alternatives that would separate the flyash from other wastes. The ARAR discussions in the Operable Unit 2 FS state that the most stringent requirements would be met when different types of wastes were disposed together. However, since none of the alternatives propose segregation of flyash, this classification may be removed.
Action: Table 2-2 has been modified to remove the exempt waste classification for the Inactive Flyash Pile.

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 2.2.2.2.4 Page #: 2-13 Line #: 23 Code: C
Original Comment #: 16
Comment: This section states that OEPA's infectious waste regulations are not applicable to the Solid Waste Landfill, because disposal of infectious waste into the landfill did not exceed 50 pounds per month based on the past number of employees. The text then explains that with 2,500 employees, the FEMP exceeded the 50 pounds per month level. Due to the fact that at one time, the FEMP exceeded the limit with 2,500 employees and that in 1956, almost 2,900 persons were employed, the regulation would be applicable. Please clarify.
Response: The number of current employees was in error; actually the number of employees and subcontractors that were on-site an receiving medical screening was 3,500.
Action: The number of people receiving medical screening has been corrected in the text in Section 2.3.2.1 (see page 2-14).

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 2.3 Page #: 2-17 Line #: 21 Code: E
Original Comment #: 17
Comment: Grammatical error.
Response: Agreed.
Action: This error was eliminated during the general revision of text in Section 2.

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 2.3 Page #: 2-19 Line #: 17 Code: E
Original Comment #: 18
Comment: Grammatical error.
Response: Agreed.
Action: This error was eliminated during the general revision of text in Section 2.

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 2.3.5 Page #: 2-47 Line #: 12 Code: C
Original Comment #: 19
Comment: Describe in further detail the source controls mentioned in this section.
Response: Agreed.
Action: Section 2.4.5 has been revised with better definitions of source controls (see page 2-51).

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 2.6 Page #: 2-57 Line #: 21 Code: C
Original Comment #: 20
Comment: The Great Miami Aquifer is not listed as contaminated media. The GMA should be included in this list.
Response: Limited amounts of the GMA sand and gravel in the Inactive Flyash Pile are contaminated. The groundwater medium is included in the ACA definition of Operable Unit 5.
Action: The list was deleted along with associated text during revisions to Section 2.0.

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: 3.2 Page #: Line #: Code: C
Original Comment #: 21
Comment: It would be helpful to identify (using a footnote) the proposed source controls in Tables 3-1 to 3-5 when referring to removal volumes.
Response: Agreed.
Action: Footnotes have been added to these tables to indicate source control options.

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 3.2 Page #: 3-1 Line #: 29 Code: C
Original Comment #: 22
Comment: Please define "kriging."
Response: Kriging is defined in Section 3.2 on page 3-2.
Action: None.

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 3.2.2 Page #: 3-9 Line #: 10 Code: C
Original Comment #: 23
Comment: An additional 11 cu m (15 cu yd) will have to be remediated due to the presence of thorium-230. It is unclear if the additional material will need to be taken from a specific area or taken from the perimeter of the Lime Sludge Pond. Please clarify from where this additional material will be removed.
Response: The particular material discussed in the comment was from the roadway along the northern side of the Lime Sludge Ponds. The revised volume calculations include this volume within 230 cubic meters of material from both the roadway and parts of the berm.
Action: The paragraph where this has been presented in Section 3.2.2 has been modified to explain that 230 cubic yards of material comes from the roadway and the berm. That material requires removal because of radium-226 as well as thorium-230.

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 3.2.3 Page #: 3-17 Line #: 16 Code: C
Original Comment #: 24
Comment: Is there a distinct boundary between flyash which is cross-contaminated and flyash which is not? Since the two are combined in the same area and will utilize different disposal techniques, it will be necessary to draw a distinct boundary between the cross-contaminated and clean flyash to prevent the cross-contaminated material from being disposed of without special consideration. It may be advantageous to handle all flyash as cross-contaminated to prevent the accidental disposal of contaminated flyash without remediation.
Response: Agreed. The flyash will all be handled as cross-contaminated.
Action: Throughout Sections 3 through 5, flyash within Operable Unit 2 is assumed to be cross-contaminated and is treated as a solid waste/low level waste.

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: 3.5.1 Page #: 3-51 Line #: Table 3-8 Code: E
Original Comment #: 25
Comment: Replace "vagative" with vegetative"
Response: Agreed.
Action: Replaced.

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: 3.5.3 Page #: 3-84 Line #: 8 Code: C
Original Comment #: 26
Comment: What kind of geotextile/geocomposite materials have a 200-year design life?
Response: The 200-year maximum design life applies to components of the composite cap other than the geosynthetics.
Action: The paragraph discussing effective life of the composite cap has been revised. Please see Section 3.5.1.3.2 on page 3-103.

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: 3.5.3 Page #: 3-85 Line #: 1 Code: C
Original Comment #: 27
Comment: Given the presence of organic refuse (e.g., cafeteria wastes) in the Solid Waste Landfill subunit, a gas migration layer (and possible LFG control system) should be at least considered as integral to the clay cap option.
Response: Direct measurement of methane does not indicate that it is a problem at the Solid Waste Landfill. However, a contingency for monitoring for methane will be considered during the remedial design period.
Action: None.

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: 3.6.5 Page #: 3-106 Line #: 25 Code: C
Original Comment #: 28
Comment: Sedimentation retention time should consider potential polymer addition to increase the settling rate. Does it?
Response: The consideration of sedimentation additives will be specifically considered during the remedial design process. Sedimentation process options are retained for all OU2 subunits.
Action: None.

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 4.2.4 Page #: 4-6 Line #: Code: C
Original Comment #: 29
Comment: PRLs must be developed to protect the GMA at each waste unit boundary. These PRLs must be achieved regardless of the future land use. The PRLs must protect the GMA to its maximum beneficial use.
Response: Agree that PRLs must assure that MCLs are met in the GMA at the waste unit boundary.
Action: Section 5.0 has been revised to show that PRLs are protective of MCLs in the GMA at the waste unit boundary. The achievement of these goals is also discussed.

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: 4.3 Page #: 4-7 Line #: 19 Code: M
Original Comment #: 30
Comment: The FS (in various Sections) indicates that uranium has migrated only a few feet into the glacial till in OU2. On April 26, 1994, DOE/FERMCO presented a conceptual model to explain the detection of dissolved uranium in lysimeters located at the base of the till. The DOE/FERMCO conceptual model is based on the migration through the till of relatively mobile (low Kd) uranium species released in the 1950s and 1960s at least in part via the atmosphere. The conceptual model presented infers the distribution of some relatively mobile (or moderately mobile) uranium species in the till at depths greater than a few feet today. We understand that these concepts of uranium migration through the till will be detailed in the OU5 RI report. Some discussion should be provided in the OU2 FS regarding these data and concepts, including why such migration does not alter the proposed remedial alternatives (even if only a brief discussion that refers to the OU5 RI report).
Response: The lysimeter data from OU5 was examined with respect to migration of uranium and affect on the proposed remedial alternatives.
Action: Appendix D incorporates additional modeling and discussion that address the implications of the lysimeter data. Please refer to OEPA Comment #65 regarding the Appendix D.

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 4.3.2 Page #: 4-8 Line #: Code: C
Original Comment #: 31
Comment: The document fails to justify remediating to different PRGs under different alternatives (e.g., Alt 2 to on-property farmer and Alt 3 to off-property farmer). This format makes it impossible to compare the effectiveness, cost, etc. of the different alternatives. The resulting comparison is apples to oranges.
Response: See Response for OEPA General Comment #4.
Action: See Action for OEPA General Comment #4.

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 4.3.4 Page #: 4-10 Line #: 10-17 Code: C
Original Comment #: 32
Comment: It is unclear from the description presented the type of consolidation which would occur for the Solid Waste Landfill. The text should briefly discuss the extent of consolidation versus capping of the entire landfill that would occur.
Response: Consolidation prior to capping at the Solid Waste Landfill will be performed for two purposes:

1. Movement of material at the fringes toward the center of the landfill to ease construction of the cap
2. Excavate portions of solid waste adjacent to railroad track and deep portion in the southeast corner of the landfill.

However, in the current revision, this type of detail was considered appropriate in Section 5.0 rather than Section 4.0.
Action: The text has been clarified in Section 5.3.1.2.1.

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 4.4 Page #: 4-10 Line #: 31-33 Code: C
Original Comment #: 33
Comment: As stated in Ohio EPA's comments on the OU2 RI, this conclusion is incorrect. The perched water is already impacted with organic contaminants (e.g., bis(2-ethylhexyl)phthalate) which were detected in the lime sludge and surface water.
Response: Agree that the referenced conclusion is incorrect.
Action: The referenced conclusion has been removed.

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 4.5.2 Page #: 4-19 Line #: 18-20 Code: C
Original Comment #: 34
Comment: DOE must provide further discussion of the proposed facility for disposal of radiologically contaminated flyash. The discussion must define the type of facility and acceptance criteria. If not such facility exists then to should not be considered. As there is no deminimus level for radiological contamination acceptance at a solid waste disposal facilities in Ohio, DOE may not consider disposal at a solid waste landfill in Ohio.
Response: Agree that the proposed disposal of radiologically contaminated flyash at a local solid waste disposal facility is not appropriate.
Action: The proposal has been deleted. All contaminated material with COC concentrations

above the relevant PRLs, except lead-containing soil from the Firing Range, will be disposed in accordance with the applicable alternative. In all alternatives, except No Action, the firing range waste is assumed to be treated and transported to the representative off-site facility for disposal.

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 4.5.6 Page #: 4-21 Line #: 26-28 Code: C
Original Comment #: 35

Comment: The alternative fails to provide a justification for the installation of an interceptor trench following remediation. The need for the interceptor trench should be discussed. As stated previously, the selected alternative must be protective of the GMA at the waste management unit boundary. From a long-term protectiveness view it would seem more appropriate for DOE to remove all contamination threatening the aquifer than to count on the effectiveness of an interceptor trench over 1000 yrs.

Response: 1) Agree that justification for the interceptor system (now referred to as a subsurface drain) needs to be provided. The outcropping of the perched groundwater in the southwestern portion of the South Field area will act as a drain for the consolidation area and the trench is proposed to assure protection of the GMA.

2) Agree that excavation of contamination is appropriate for long-term protectiveness. Consequently, use of an interceptor system has been limited to the consolidation and capping alternative.

Action: Justification for the interceptor system in the consolidation and capping alternative has been included (see Section 4.3.2.1). However, the interceptor system has not been used in alternatives other than consolidation and capping.

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 4.6 Page #: 4-24 Line #: 31-32 Code: C
Original Comment #: 36

Comment: No basis is provided for the assumption that washed soil would not require disposal in an engineered facility. It is likely these soils will be a solid waste due to the presence of contaminants not removed or potentially added during the treatment. DOE must provide additional justification for the assumption including a discussion of how such an assumption would protect the GMA.

Response: Agreed.

Action: The assumption, that soil washing would eliminate the need for disposal in an engineered facility, has been eliminated.

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 4.6 Page #: 4-27 Line #: 1-4 Code: C
Original Comment #: 37

Comment: DOE should include a discussion of the volume of soil proposed to be left behind which will exceed PRLs developed for groundwater protection. The effectiveness of an interceptor trench over the 1000 year time frame is very questionable. For long-term protectiveness of the GMA, Ohio EPA believes DOE must consider excavation of all soils exceeding the groundwater protection PRLs.

Response: The referenced statement indicates that an interceptor trench would be required for most alternatives to control the lateral flow of perched groundwater and avoid complete removal of all uranium-impacted material. As mentioned in the response to OEPA Comment #35, DOE agrees that excavation of contamination is appropriate for long-term protectiveness. Consequently, use of an interceptor system has been limited to the consolidation and capping alternative where the interceptor system is required to be protective of GMA groundwater.

Action: Except for the consolidation and capping alternative, excavation of all soil exceeding groundwater protection PRLs was proposed to be excavated.

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 4.6.2 Page #: 4-27 Line #: 17-19 Code: C
Original Comment #: 38

Comment: DOE fails to discuss the status of radiological contamination in the firing range soils. This is especially important to determine whether the waste will be mixed waste or simply hazardous waste. DOE must clarify this within the text.

Response: Agreed. Radiological screen during a proposed RSE action did not indicate radiological contamination in that area. However, based on other samples in the general area, radiological contamination will be assumed. Therefore, the soil will be considered a mixed waste. It will be assumed to be disposed off-site at a commercial, mixed waste facility. However, the option of handling it differently, pursuant to screening during remedial action or Operable Unit 5's handling of mixed wastes, will be maintained.

Action: The mixed waste status of the soil from the firing range has been mentioned briefly in Section 4.2.5.2 and discussed in more detail in Section 5 (see, for example, Section 5.3.1.2.2).

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 4.6.3 Page #: 4-27 Line #: 29-31 Code: C
Original Comment #: 39

Comment: Again, DOE fails to discuss radiological contaminants at the firing range. Additionally, DOE must provide a justification for only excavating soils to levels exceeding TCLP. Soils below TCLP would still be considered a solid waste and present a hazard to receptors.

Response: (1) See Response for OEPA Comment #38.
(2) Soil below the toxic characteristic level but above the CERCLA Guidance level (see U.S. EPA General Comment #43) will be assumed to be a solid waste. Below the CERCLA Guidance level will not be considered a waste.

Action: See Action for OEPA Comment #38.

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: 5 Page #: Line #: Code: C
Original Comment #: 40
Comment: Do the costs associated with the On-Site Disposal alternatives presume its selection for multiple subunits? It would be helpful to identify any major costing assumptions related to subunit alternative selection dependencies in main text.
Response: Agree that costing assumptions should be clearer. With the change to operable unit-wide alternatives, this issue has been resolved.
Action: None in addition to the modifications made to Appendix F to address operable unit-wide alternatives.

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: 5 Page #: Line #: Code: C
Original Comment #: 41
Comment: A great deal of the repetitive discussion evaluating the remedial alternatives could be "consolidated" by referencing and by reorganization of the report.
Response: Agree that the length and repetitiveness of the section can be reduced. With the change to operable unit-wide alternatives, only four alternatives are anticipated to be carried into the detailed analysis from Section 4.0. To avoid having to turn to other alternatives for descriptions, the convention of making each alternative "stand alone" will be maintained.
Action: None other than the presentation of alternatives for Operable Unit 2 as a whole rather than subunit specific alternatives.

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: Page #: Line #: Code: C
Original Comment #: 42
Comment: The proposed location of an interceptor trench along the SW and SE perimeter of the consolidation-containment cell appears appropriate. Detailed design of an interceptor trench should consider the slope of the base of the sand layer for which the trench is designed to provide hydraulic containment. The effective available draw down to achieve hydraulic control over this sand layer may be a few feet or less. The direction of perched groundwater flow may be primarily controlled by the slope of the base of this sand layer. No structural contour map of base of this sand unit is given in the RI or FS.
Response: Agree that the slope and base elevation of the sand layer are final design considerations. However, cross-sections shown in Figures 3-6 through 3-10 show the sand layer. Based on these cross-sections, base elevations (elevation 564 to 561) and slopes (generally to the south-southeast) determine the location and depth of the trench. Detail contours of the base of the sand unit, and basis for the exact location of the interceptor trench, will be determined during remedial design for Operable Unit 2 and/or 5, depending on the preferred alternative.
Action: Figures 3-6 through 3-10 are referenced in the discussion of the trench design in Appendix E.4.

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: Table 5-1 Page #: 5-3 Line #: Code: C
Original Comment #: 43

Comment: DOE is not considering any alternative involving treatment for the solid waste landfill. DOE should include an alternative that evaluates treatment of at least the most contaminated materials from the landfill.

Response: Agree that treatment of more contaminated material from the Solid Waste Landfill should be considered. The revised alternatives address treatment of the most contaminated materials from the Solid Waste Landfill as well as the South Field and the Inactive Flyash Pile. The alternatives are developed in Section 4.0.

Action: As noted in Table 3-22, treatment has been considered potentially applicable for some material from the Solid Waste Landfill. This carries through on an operable unit-wide basis in Section 4.

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 5.2.1.2.1 Page #: 5-14 Line #: Code: C
Original Comment #: 44

Comment: As stated in a previous Ohio EPA comment, DOE should incorporate either within the Overall Protection of Human Health and the Environment or the Long-Term Effectiveness and Permanence criteria a discuss of protection of the GMA at the waste management until boundary.

Response: Agree that a discussion of the protection of the GMA at the waste unit boundaries will be included.

Action: Compliance with MCLs and non-zero MCLGs at the subunit/disposal facility boundary has been added to the discussions on compliance with chemical-specific ARARs in Section 2.3 and ARAR portions of Section 5.0.

NOTE: THERE WAS NO COMMENT NUMBERED 45.

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 5.2.2 Page #: 5-16 Line #: Code: C
Original Comment #: 46

Comment: As stated in a previous Ohio EPA comment, DOE must evaluate off-site disposal at a representative commercial facility for this and all other OU2 subunits.

Response: Agree that an off-site commercial disposal facility should be evaluated. Envirocare has been used as the representative commercial disposal facility. NTS and Envirocare were compared on the basis of cost in Section 4.0. Envirocare was thereafter assumed to be the representative off-site disposal facility.

Action: Envirocare has been assumed as the representative off-site disposal facility in Sections 5.0 and 6.0.

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 5.2.2.1.4 Page #: 5-23 Line #: 27-31 Code: C
Original Comment #: 47
Comment: Define "IBC" and "ISO".
Response: Agree that the acronyms should be defined. IBC refers to International Bulk Containers and ISO refers to International Shipping Organization.
Action: Definitions of these acronyms have been added to the discussion as well as to the list of acronyms.

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 5.2.2.1.5 Page #: 5-24 Line #: 20-21 Code: C
Original Comment #: 48
Comment: DOE should include the NTS waste acceptance criteria as an appendices to the document.
Response: Agree that waste acceptance criteria should be included.
Action: Waste acceptance criteria for NTS, Envirocare, and on-site disposal have been included in Appendix E.2.

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: Figure 5-6 Page #: 5-42 Line #: Code: C
Original Comment #: 49
Comment: Additional monitoring wells will also need to be installed at the solid waste landfill area as waste was left in place and will require long-term monitoring.
Response: Agree that monitoring wells should be provided at the Solid Waste Landfill for long-term monitoring. Wells were identified on Figure 5-11 but omitted from Figure 5-6 of the April FS.
Action: Monitoring wells have been included on the Solid Waste Landfill site restoration figures (5-5 and 5-14).

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: Figure 5-9 Page #: 5-47 Line #: Code: C
Original Comment #: 50
Comment: DOE will need to conduct compatibility testing between the lime sludge/flyash mixture and the proposed liner system.
Response: Agree that compatibility testing should be conducted as part of a treatability study if stabilization becomes part of the preferred alternative. Preliminary tests of the flyash leachate indicate a pH of about 7.0. The mixture is expected to be slightly alkaline and therefore compatible.
Action: None for purposes of the FS Report.

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 5.2.3.1.1. Page #: 5-48 Line #: 6-8c Code: C
Original Comment #: 51

Comment: It would seem that as DOE adds new structures to the site they would be trying to make them in a manner which would allow for the easiest and quickest decontamination. Since no treatment option currently exists or is even considered for asphalt it would seem to be a material to be avoided. DOE must start thinking long-term and choose materials we can decontaminate following remediation. DOE should consider this during the development of alternatives and especially during RD/RA.

Response: Agree that long-term disposition of materials should be considered. Waste minimization will be incorporated into all aspects of the design. However, it may be necessary to pave portions of the storage areas to support heavy equipment. The cost effectiveness of using concrete or asphalt in terms of volumes, cost, and ability to be decontaminated will be assessed.

Action: The operable unit-wide alternatives use common support facilities in two locations in order to minimize waste. One location is between the landfill and the sludge ponds; the other location is in the South Field Vicinity. Additional aspects of waste minimization will need to be addressed during the RD/RA workplan and remedial design.

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: 5.5.2.2.5 Pg.#: 5-340 Line #: 20 Code: E
Original Comment # 52

Comment: It appears that "0.23 and 6.0" should be "6.0 and 0.23".

Response: Agree that the injuries/fatalities are in the incorrect order.

Action: None. New injuries/fatalities were calculated based on the revised alternatives.

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: 5.5.7.2.5 Pg.#: 5-454 Line #: 24 Code: M
Original Comment # 53

Comment: Will the interceptor trench really penetrate into the upper GMA as stated? If it does, how will contaminated groundwater that enters the trench from the glacial overburden layers be prevented from leaking downward into the unsaturated GMA?

Response: No, the interceptor trench will not penetrate into the upper GMA.

Action: The sentence has been revised to delete the reference to the upper GMA.

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: Table 6-15 Pg #: 6-31 Line #: 28 Code: C
Original Comment #: 54

Comment: DOE fails to provide any justification to support stating that soil washing is more effective than solidification or vitrification. DOE must delete reference to soil washing being more effective or provide additional information. It is unclear how soil washing could ever be considered more effective than vitrification for long-term protectiveness and permanence. It would seem based upon the data presented to date by DOE, that vitrification is by far the most effective technology with regard to long-term effectiveness and permanence.

Response: See Response for OEPA Comment #36.

Action: See Action for OEPA Comment #36.

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Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 6.4.2.2 Pg #: 6-33 Line #: 1-6 Code: C
Original Comment #: 55
Comment: DOE has not provided any evidence that soil washing could effectively reduce the amount of material requiring disposal. DOE has not justified soil washing as "the best of the contaminated material treatment alternatives". DOE should delete this statement.
Response: See Response for OEPA Comment #36. This statement will be deleted.
Action: See Action for OEPA Comment #36.

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 6.4.2.2 Pg #: 6-33 Line #: 8-11 Code: C
Original Comment #: 56
Comment: The section should state that vitrification would reduce toxicity through the destruction of organic contaminants and result in a reduction in volume of waste. The text should also state that vitrification, based upon available data, would most effectively reduce mobility of contaminants.
Response: Agree that vitrification would reduce toxicity and most effectively reduce mobility. However, only small amounts of material would potentially be receiving any type of treatment in the alternatives carried forward to Sections 5.0 and 6.0. Because of that, comparison of treatment methodologies did not need to be incorporated into Section 6.0.
Action: None.

Commenting Organization: Ohio EPA Commentor: OFFO
Section #: 6.4.2.4 Pg #: 6-37 Line #: 15-19 Code: C
Original Comment #: 57
Comment: Based upon the statements in this section, what is DOE's basis for statements in previous sections that soil washing is the most effective of the contaminated material treatment alternatives?
Response: See response for OEPA Comment #55.
Action: See action for OEPA Comment #55.

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: D.3.2 Pg. #: D-3-6 Line #: 13-17 Code: E
Original Comment # 58
Comment: The relationships between uranium isotopes is different between sections D and E of the report. The values are similar, but should be consistent.
Response: Relationships between various uranium isotopes presented in Appendix D are in terms of isotopic activity based on site-specific data. While those in Appendix E are in terms of mass ratio based on naturally occurring uranium. When the isotopic activities are converted to mass ratio, the relationships are:

Uranium-234 (g) = 4.916×10^{-5} Uranium-238 (g)
Uranium-235 (g) = 7.467×10^{-3} Uranium-238 (g)

Since uranium-238 constitutes 99.25% of total mass. Other isotopes in terms of total uranium mass are: Uranium-234 = 0.00488%; Uranium-235 = 0.741%. The values for uranium-238, -234, and -235 presented in Section E.1.2.6 of the revised FS are

99.27%, 0.0055%, and 0.72%, respectively. While the differences do represent different assumptions and it is appropriate to point this out in the text, the difference between these assumptions has insignificant affect on subsequent calculations.

Action: The basis for each conversion is provided in the text in Sections D.1.3 and E.1.2.6.

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: D.3.4.1 Pg. #: D-3-19 Line #: Code: C
Original Comment # 59

Comment: The rate of loading of Tc-99 to the Great Miami Aquifer is predicted to be significantly less after consolidation/containment at the Solid Waste Landfill. In Figure D.3-4, the long-term (1,000 year) loading rate from ODAST is approximately 3.0 x 10^{-7} Kg/yr. What is the reason for the constant rate rather than a declining rate which reflects the assumed depletion time? It is noted that the rate in the FS is approximately an order of magnitude lower than the RI (2.9x 10^{-6} Kg/yr) calculations. In the consolidation/containment case, it is understandable that it requires 200 to 400 years for the material to enter the GMA, levelling off at 30 pCi/L. In the RI (Figure A.2-15), the loading concentration declines from about 30 to almost nothing after 1,000 years.

Response: In the RI scenario, the infiltration rate was 9.03 inch/year, while the infiltration rate through the cap in the FS was 1.14 inch/year. Therefore, total mass loading rate (concentration times infiltration rate) in the consolidation/containment will be approximately an order of magnitude lower than in the RI. Also, due to reduced infiltration rates, source depletion times (source depletion half life) increase by an order of magnitude. This essentially results in constant loading rate to the Great Miami Aquifer between approximately 400 years and simulation time of 1000 years.

Action: None.

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: D.3.3.2 Pg. #:D-3-12 Line #: 8-15 Code: C
Original Comment # 60

Comment: Has there been a change in the source depletion assumptions? There is no definition of the source depletion half-life time, $T_{1/2}$, as was presented in the RI. This definition of source depletion time, τ_o, is asymptotic, whereas the concept of a factor, α, can be used to define the half-life source depletion time. It is unclear how the depletion factor and time are used (see page D.3-13, lines 33-34).

Response: There are no changes in the source depletion assumptions between the RI and the FS. Appendix D of the April FS only presented FS specific information or changes from the RI. As noted on lines 25-26 on page D-3-1 (of the April FS), details were included in Appendix A of the Final RI Report for OU2.

Action: Details of source depletion assumptions have been included in Appendix D.1.4.2 of the revised FS. A note about referencing Appendix A of the RI Report for modeling details is included on page D-1-1.

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: D Pg. #:D-3-22 Line #: Code: C
Original Comment # 61
Comment: How was the maximum infiltration rate of 93.6 inches from the perched water seep pathway from the South Field/Inactive Flyash Pile calculated? The conclusion is that perched water must be controlled, a not unexpected conclusion. It is not clear whether the HELP model or some other means was used for this. There are no results in Appendix E.3
Response: The maximum infiltration rate of 93.6 inches from the perched water seep pathway was taken from Table A-2-35 of the RI. These infiltration rates were calculated using Darcy's Law, the observed gradients in the perched water, hydraulic conductivity measured for the sand and gravel by the slug tests (conducted by OU5), and measured thickness of the sand/gravel layer at the South Field/Inactive Flyash Pile.
Action: The revised text for the subsurface seep pathway is in Section D.1.5.3.1, p. D.1-37.

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: D Pg. #:D-3-35 Line #: 6 Code: C
Original Comment # 62
Comment: The perched water is included as a source for vertical infiltration, but how? Is the perched water used to calculate the infiltration rates reported in Table D.3-6 or is this from the HELP model using rainfall as the water source? Wouldn't the perched water, even if controlled, provide a positive head across the till?
Response: It is recognized that perched water provides a positive head across the till. This is also evident from the peak heads calculated by the HELP model on each layer. Infiltration rates in Table D.3-6 in the April FS were from the HELP model using rainfall as the water source. Perched water was also used as a future source of contamination to the Great Miami Aquifer. It was assumed that the perched water will infiltrate at the same rate as the infiltration rates calculated by the HELP model. This approach was used because seasonal water level fluctuations in 1000-series wells are large. Current perched water concentrations and the thickness of the sand/gravel unit was used to define the contaminant mass available for vertical infiltration from the perched water.
Action: Discussions of perched water are include in Sections D.1.2 and D.1.5.3.1.

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: D Pg. #:D-3-41 Line #: Code: C
Original Comment # 63
Comment: Should the infiltration for Zone 4 be 21.12 inches/year?
Response: The infiltration rate for the Zone 4 should have been 2.13 inches/year and not 21.13 inches/year.
Action: None. During revision of Appendix D, infiltration rates are noted in the text and in Table D.1-17.

Commenting Organization: Ohio EPA Commentor: Geotrans
Section #: D.4 Pg #: Line #: Code: M
Original Comment #: 64

Comment: As noted, the K_d values for adsorption tests were much lower than those for desorption tests, even for tests conducted on the same soil sample (e.g., glacial overburden taken from South Field Trench No. 4: adsorption K_d = 12.0 L/kg, desorption K_d = 280 L/kg). DOE (D-4-15, line 26) concludes that, " The desorption test is considered more representative than the adsorption test because it more accurately represents actual site conditions and the chemical form of the uranium." This statement appears to be an overgeneralization of uranium transport at the site. Although the leaching of adsorbed uranium from the contaminated zone involves desorption, the migration of dissolved uranium from more-to-less contaminated portions of the subsurface is better characterized as an adsorption partitioning process. Thus, the appropriateness of the desorption and adsorption partition coefficients depends on where and for what period of time the value is being applied. Can the dissolved uranium leached into solution during a desorption test then be used for an adsorption test? It seems that this adsorption test would provide a more representative Kd for the mobile uranium species migrating into uncontaminated media?

In the FS report, DOE has proposed the concept that some uranium is essentially immobile in the soil (irreversible sorption). When doing a desorption test, the calculated partition coefficient reflects the lumping of mobile and immobile uranium. Thus, a higher coefficient is derived than can be attributed to the more mobile portion of uranium present.

Clearly the partitioning data are limited, temporally and spatially, and subject to significant uncertainty. We look forward to the OU5 RI report for a more detailed evaluation of how different fluid quality and uranium species released and present over time has affected uranium migration in different areas.

Response: Because of the uncertainties inherent in K_d determination, the FS has examined the sensitivity of the OU2 modeling with regard to K_d.

Action: Appendix D.1.7 discusses the sensitivity of the modeling with regard to K_d. The revised OU2 FS utilizes two Kd values for the gray clay:

- 24 was presented in OU5's geochemical report as an appropriate adsorption K_d for waste materials based on empirical evidence which includes the results of the OU2 K_d study. This value was applied to the waste in place at the Operable Unit 2 subunits.

- A value of 3.1 was developed by using ODAST to model the OU5 lysimeter data. While this number was not applied to OU2 wastes (because of the existence of actual test data), it was conservatively assumed that it could apply to other wastes at the FEMP. Since the proposed on-site disposal facility might include wastes outside Operable Unit 2, the K_d of 3.1 was applied to modeling of preliminary waste acceptance criteria for an on-site disposal facility.

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: D Pg. #: Line #: Code: C
Original Comment # 65
Comment: References are missing throughout this section.
Response: Agreed.
Action: References have been corrected.

OU1/OU2 CRARE Comments

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: I.6.1.1 Pg. #: I-6-4 Line #: 28 Code: E
Original Comment # 66

Comment: In describing the revised flow and transport grid, please refrain from the term "squares". The choice of uniform areal mesh dimensions in the model application is appreciated, especially as values are interpolated from the regional model. Please refer to the grid more accurately in terms of dimensions. Also a mention of the layering would be helpful. Ideally, further details of the offset and rotation between the regional and site models could be presented.

Response: The term "squares" will be changed to "cells". The six layers of the model will be mentioned. The smaller site model is overlaid on the regional model, but not offset or rotated from it.

Action: Text has changed in Section I.6.1.1 (p. I-6-6).

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: I.6.1.2 Pg. #: I-6-7 to I-6-12 Line #: Code: M
Original Comment # 67

Comment: The basis for additional screening of COCs for OU3 and OU5 is inconsistent, inappropriate and not conservative. The basis of screening is transport process-based, not health-based. The use of "average" or best estimate travel through the till is not meaningful. There is no basis for establishing a normalized 10^{-4} breakthrough concentration as non-endangering. Is the basis for choosing 10^{-4} because the tabular results of the referenced analytical solution are limiting?

Response: The additional screening of COCs for OU3 and OU5 will be changed to a health-based approach. The COC list will be screened by incorporating the results of the OU5 RI Risk Assessment (June, 1994, Section A.5.0). This is a very conservative approach, since this risk assessment does not incorporate any future remedial activity. The future land use, on-property RME farmer scenario in the OU5 RI Risk Assessment will be selected for the screening. This scenario incorporates the maximum potential exposure that could be experienced by an individual pursuing an agricultural lifestyle on the FEMP. Only COCs with an ILCR of $1x10^{-6}$ or greater, or an HQ of 1.0 or greater for the ingestion of groundwater from any area for the RME on-property farmer will be carried forward. The groundwater COC's for OU3 and OU5 that pass this screening are Np-237, Ra-226, Sr-90, Tc-99, U-234, U-235/236, U-238, arsenic, beryllium, and antimony. These COCs encompass 100% of the total ILCR ad 95% of the total Hazard Quotient for groundwater ingestion under the RME on-property farmer.

Action: Text has been revised in Section I.6.1.2 (p. I-6-6 & I-6-8).

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: I.6.1.2 Pg. #: I-6-8 Line #: 19 Code: M
Original Comment # 68
Comment: Why is the "Brenner, 1962" solution used? This is the analytical solution for adjective-dispersive transport through a column with a third-type (flux) input and zero-gradient efflux boundary condition. There are many other references to choose from for which programs are readily available. There is no discussion regarding the appropriateness of a finite-column over a semi-infinite solution. There is no reference or discussion on how to solve for this solution. It would appear that we have to assume that the writer correctly non-dimensionalized the values and accurately used the published table look-up. If other solutions were used for this screening, values substantially less than 10^{-4} could have been used. There is no discussion as to why "M factors" of 0.1 are used for OU3 and 0.5 for OU3.
Response: See #67.
Action: Same as for #67.

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: I.6.1.2 Pg. #: I-6-8 Line #: 9 Code: C
Original Comment # 69
Comment: It would be helpful to include a table summarizing the values used to calculate mean travel times through the vadose zone (rather than just referencing the SWCR).
Response: See #67.
Action: Same as for #67.

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: I.6.1.2 Pg. #: I-6-9 Line #: 19 Code: C
Original Comment # 70
Comment: Why declare certain chemicals as "not determined" because retardation factors are not available to perform travel time calculations? Is it not possible to estimate conservative retardation factors (based on Kow or other data)?
Response: See #67.
Action: Same as for #67.

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: I.6.1.3.1 Pg. #: I-6-16 Line #: 16 Code: C
Original Comment # 71
Comment: The use of "inverse distance" via Surfer for interpolation should be presented in greater detail. The choice of the power, i.e., 2nd, 4th, or 6th has been shown to change the total mass calculated by as much as an order of magnitude at some sites. The report never details the number of data points used in the surface fitting. The report doesn't describe any log transformation prior to gridding. There is no discussion as to how the vertical averaging was performed (mean, geometric mean ?).
Response: Additional information will be included on the parameters used in the Surfer calculations and the related data analysis.
Action: Text has been changed in Section I.6.1.3.1 (p. I-6-11).

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: I.6.1.6.3.1 Pg. #: I-6-16 Line #: 18-22 Code: C
Original Comment # 72

Comment: The discussion on how leachate concentrations are derived from soil concentration measurements needs to be clarified. There is no mention as to the soil water content. What degree of uncertainty is associated with the assumptions that only 5 and 30 percent of the uranium (in treated and untreated soils, respectively) will be mobile over hundreds of years?

Response: An example calculation will be included of the determination of leachate calculations. The assumptions that only 5 and 30% of the uranium will be mobile, will be deleted. 100% mobility will be assumed. OU5 has also determined that the concentration of U-238 in treated soils can be estimated to be 100 ppm, with a leachate concentration of 1.0 ppm. Also, the Kd of U-238 for all OU5 areas will be 24.

Action: Text has been changed in Section I.6.1.3.1 (p. I-6-11 & I-6-12).

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: I.6.1.3.2 Pg. #: I-6-17 Line #: 20 Code: C
Original Comment # 73

Comment: The assumption that the infiltration rate through washed and backfilled soil in localized areas (e.g., Plant 2/3, Plant 6, and Plant 9) will be reduced to 0.75 inches/year for hundreds of years due to compaction, vegetation, and mixing of backfill soil with low permeability materials seems overly optimistic. Settling, tension cracking, permeability enhancements associated backfill and vegetation may result in a much higher infiltration rate.

Response: The 0.75 in/year infiltration rate represent a target value for the backfill/soil capping design for these localized ares. The actual design and resulting hydrologic parameter will be developed by OU5 and presented in their FS.

Action: Text has been changed in Section I.6.1.3.2 (p. I-6-19).

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: I.6.1.3.3 Pg. #: I-6-17 to I-6-31 Line #: Code: M
Original Comment # 74

Comment: The calculations for leakage through the vault systems are speculative and not defensible calculations. These calculations are based on many arbitrary assumptions. It is difficult to follow the presentation. In particular, the discussion should better distinguish between flow through the vault cover and flow through the vault floor. From the presentation, it is not possible to identify the water flow input to ODAST. There are no velocities reported. The concluding figure (I.6-5) of depletion rate of U-238 is interesting, but what area is considered? Is it the mass from one of the source areas? It would appear to be the total (less the mass in the Eastern Vaults) and be primarily from OU1 soils and OU2 South Field & Inactive Flyash Pile.

Response: Section I.6.1.3.3 will be rewritten to eliminate some of the broad-based information and to provide more focus on the assumptions of vault design. Additional information will be provided on estimated infiltration through the capping material overlying the concrete vault. Flow through the vault cover will be distinguished from flow through the vault floor. The flow input to ODAST is the same as the infiltration rate, as the conservative assumption was made that water entering the vault is not retarded by it.

Figure I.6-5 presents the U-238 present in the total soils from all areas, excluding the

OU3 building rubble in the Eastern Vaults.

Action: Text has been changed in Section I.6.1.4.2 (p. I-6-25).

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: I.6.1.3.3 Pg. #: I-6-22 Line #: 20-29 Code: M
Original Comment # 75

Comment: The assumed hydraulic conductivity of the degraded vault of 0.032 cm/yr (1×10^{-9} cm/sec) is very optimistic. This value presumes that there will be no permeability enhancement due to cracking over the long term (1000 years). This is unrealistic. Similarly, the assumed infiltration rate into the vault over hundreds of years appears to be very optimistic. Given that the rate of infiltration through the cover (and sides) into the vault will exceed the rate of exfiltration through its floor and walls over time, what is to prevent development of the "bathtub" effect?

Response: As discussed for #74, Section I.6.1.3.3 will be rewritten to provide more information and justification on vault design and infiltration calculations. The "bathtub" effect is not estimated to occur because the leachate collection system in and beneath the floor of the vaults will be constructed of the same concrete as the vault roof, but probably thinner. A much greater head of water could also build up in the leachate sumps, as compared to the sloping roof. This would increase the leakage rate into the subsurface soil.

Action: Text has been changed in Section I.6.1.3.3 (p. I-6-20 to I-6-22).

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: I.6.1.6.1 Pg. #: I-6-40 Line #: 8 Code: E
Original Comment # 76

Comment: In discussing groundwater models, please change "compiled for nearly optimized performance" to something more in context, such as "compiled using optimizing Fortran compilation parameters."

Response: Agreed.

Action: The text has been revised to describe the optimization approach in Section I.6.1.1 (p. I-6-43).

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: I.6.1.6.2 Pg. #: I-6-43 to 6-49 Line #: Code: C
Original Comment # 77

Comment: It is difficult to understand (based on the information provided in the CRARE) the relation between the source areas and the predicted groundwater concentrations for the selected U238 and Tc99 plots (Figures I.6-7 through I.6-12). It would be helpful if the results in Table I.6-5 were presented in graphical (georeferenced) format, using proportional symbols.

Response: A bar graph will be included in which the length of each bar will represent the Mass Transport to Groundwater After 1000 years (log scale) for each source area under each COC. These results are currently presented in the third column of Table I.6-5. COCs with no mass transport to groundwater will not be included.

Action: Text in Section I.6.1.6.2 has been revised.

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: Pg. #: Line #: Code: C
Original Comment # 78

Comment: The assumptions made regarding and affecting simulated contaminant fluxes to the GMA from the different OUs through time are subject to great uncertainty. No sensitivity analysis is presented to assess the significance of this uncertainty. Long-term monitoring will be required (and relied on) to demonstrate the effectiveness of remedies implemented at the site. Remedial design should not preclude enhancement of containment, if determined to be necessary.

Response: A discussion of the uncertainties and relative significance of vadose zone and groundwater modeling parameter is currently included in Section I.10.5.2. Long-term monitoring and remedial design requirements are addressed in the FS documents for each Operable Unit, and not in the CRARE.

Action: Text have been modified in Section I.10.5.2 (p. I-10-15 to I-10-18) to refer the reader to the FS documents for long-term monitoring and maintenance.

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: Pg. #: I-4-1 to I-4-16 Line #: Code: C
Original Comment # 79

Comment: If the initial selection of COCs was based on the methodology used for the Remedial Investigation Report Baseline Risk Assessment for Operable Unit 2, this process may be in error. For the OU2 document, the Region III risk-based screening document (USEPA 1993) was used which is outdated and inaccurate for carcinogens. This out dated version of the document should not have been used in any selection/screening step of COCs for the CRARE or preceding documents.

Response: Agreed.

Action: The July version of the OU2 RI has abandoned the use of the Region III risk-based screening document, per USEPA comments (April, 1994). All risk-based screening has been conducted using USEPA RAGS Part B methodology. COCs have been updated accordingly.

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: I-7 Pg. #: Line #: Code: G
Original Comment # 80

Comment: The sources used for determining the chemical-specific gastrointestinal absorption fractions should be referenced in Table I.7-3 and documented in each of the toxicity profiles, consistently. The text of Section I.7.2 references the default values used for most inorganics and most organics, but these need to be referenced in the Table as well. In addition, the values used other than the defaults need to be referenced in the text and Table.

Response: Agreed

Action: The sources for determining the chemical specific gastrointestinal absorption fractions have been referenced in Section I.7.2 (Table I.7-3, p. I-7-7).

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: I-7 Pg. #: I-7-2 Line #: Table I.7-1 Code: M
Original Comment # 81
Comment: The most up-to-date toxicity criteria should be used in the risk assessment: Barium, RfDi is 1.4E-04, RfConc (Air) is 5.2E-05 Boron, RfConc (Air) is 2.1E-03 Copper, RfDo 3.71E-2 Mercury, RfConc is 3.1E-05
Response: DOE agrees that the most up-to-date toxicity criteria from USEPA IRIS or USEPA HEAST should be used in the risk assessment.
Action: The toxicity criteria for Barium, Boron, Copper, and Mercury have been confirmed in IRIS or HEAST and updated as appropriate in Section I.7.1 (Table I.7-1, p. I-7-2).

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: I-7 Pg. #: I-7-5 Line #: Table I.7-2 Code: MA
Original Comment # 82
Comment: Inhalation Cancer Slope Factors for Cadmium and Chromium should be $6.3x10^{0}$ and $4.2x10^{1}$, respectively, according to IRIS, 1994.
Response: The inhalation cancer slope factors for Cadmium and Chromium will be confirmed in IRIS.
Action: The inhalation cancer slope factors for Cadmium and Chromium has been confirmed in IRIS and updated as appropriate in Section I.7.2 (Table I.7-2, p. I-7-5).

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: I-7 Pg. #: I-7-4 Line #: 19 Code: ED
Original Comment # 83
Comment: "because are they are..." should be "because they are..."
Response: Agreed.
Action: Text has been changed in Section I.7.2 (p. I-7-4).

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: I-7 Pg. #: I-7-33 Line #: 24 Code: ED
Original Comment # 84
Comment: "of variation" should be "variety"
Response: Agreed
Action: Text has been changed.

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: I-7 Pg. #: I-7-34 Line #: 17 Code: ED
Original Comment # 85
Comment: The RfD for uranium is $3x10^{-3}$ as stated in the RfD table, but is reported incorrectly in this part of the text.
Response: The RFD for uranium in the text which is stated as $3\mu g/kg/day$ is the equivalent of $3x10^{-3}$ mg/kg/day. For consistency the text valve will be changed to $3x10^{-3}$ mg/kg/day.
Action: The text value has been changed to $3x10^{-3}$ mg/kg/day in Section I.7.5.12 (p. I-7-29).

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: I-7 Pg. #: I-7-46 Line #: 11 Code: ED
Original Comment # 86
Comment: "animals" should be singular, "animal"
Response: Agreed
Action: The text has been changed in Section I.7.6.5 (p. I-7-40).

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: I-7 Pg. #: I-7-53 Line #: 19 Code: ED
Original Comment # 87
Comment: misspelled "intraperitoneal"
Response: Agreed
Action: Text has been changed in Section I.7.6.14 (p. I-7-51).

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: I-7 Pg. #: I-7-55 Line #: 4 Code: ED
Original Comment # 88
Comment: "humans carcinogenicity" should be singular "human carcinogenicity"
Response: Agreed.
Action: Text has been changed in Section I-7-6-14 (p. I-7-52).

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: I-7 Pg. #: I-7-57 Line #: 25 Code: ED
Original Comment # 89
Comment: Delete "because of the dogs," - redundancy.
Response: Agreed
Action: The redundant "because of the dogs" have been deleted.

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: I-7 Pg. #: I-7-63 Line #: 20 Code: ED
Original Comment # 90
Comment: "half-live" should be "half-life"
Response: Agreed
Action: The text has been changed in Section I.7.6.23 (p. I-7-64).

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: I-8 Pg. #: I-8-4 Line #: Table I.8-1 Code: ED
Original Comment # 91
Comment: title - "CRANE" should be "CRARE"
Response: Agreed
Action: The text has been changed in Section I.8.3 (Table I.8-1, p. I-8-4) to read "CRARE".

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: I-8 Pg. #: I-8-5 Line #: Table I.8-1 Code: M
Original Comment # 92
Comment: Use of the FI factor of 0.25 and 0.125 for the trespasser scenarios may not be appropriate since these values assume that a child ingests similar quantities of soil throughout the entire portion of the day when the child or adult is awake. It would not be reasonable to assume that children or adults engaged in the activities outlined for the pathway, consume similar quantities of soil while playing in soil at the site than during periods of time while indoors. Therefore, a higher FI value should be used (a conservative value of 1 is generally recommended). Using the FI factor of 1, as compared to the values used in the report, should result in risk estimates approximately 4 and 8 times higher than when using FI values of 0.25 and 0.125, respectively.
Response: The FI parameters used for the trespassing child reflect the transient and part-time on site exposure. To increase the trespassing child's FI value to 1.0 would raise their exposure to that of a child who lives on-site.
Action: No action is required.

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: I-8 Pg. #: I-8-9 Line #: Table I.8-3 Code: C
Original Comment # 93
Comment: The maximum CDI for Groundskeeper, Soil Ingestion, Radionuclides should actually be U-234 with a CDI of 1.3E-4 pCi.
Response: All risk values are being recalculated to reflect the new preferred remedial alternative for Operable Unit 2. As such, these values will change and be checked.
Action: Text and tables have been revised in Section I.8.0.

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: I-9 Pg. #: I-9-17 Line #: 8 Code: ED
Original Comment # 94
Comment: "pathways" should be singular.
Response: Agreed.
Action: Text has been changed from pathways to pathway.

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: I-11 Pg. #: Line #: Code: G
Original Comment # 95
Comment: General Comment concerning Pathway Risks Tables (I.11-2 through I.11-4): although it is mentioned in the text, the titles for these tables need to indicate that only risks for "major contributing COCs" are presented along with total risks.
Response: Comment noted.
Action: Table has been changed in Section I.11.2 (p. I-11-3) to reflect that risks for major contributing COCs are presented along with total risks.

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: I-11 Pg. #: I-11-6 Line #: Table I.11-2 Code: C
Original Comment # 96
Comment: ILCR subtotal for Dermal (Soil) for Trespassing Child should be **$7.8x10^{-6}$**.
Response: All risks are being recalculated to reflect the revised preferred remedial alternative for Operable Unit 2. As such, the risk values will all be revised and checked. Special attention will be provided to QA the integration of text and tables.
Action: Text and tables have been revised.

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: I-11 Pg. #: I-11-7 Line #: Table I.11-3 Code: C
Original Comment # 97
Comment: For Drinking Water for Off-Property Farm Adult, ILCR chemical listing should include Tc (which had a corresponding cancer risk of $7.8x10^{-5}$) which is actually greater than either of the other chemicals listed for this pathway.
Response: All risks are being recalculated, as such, risk values will change. When risks are recalculated they will be integrated into tables and text.
Action: Text and tables have been revised.

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: I-11 Pg. #: I.11-8 Line #: Table I.11-4 Code: C
Original Comment # 98
Comment: ILCR for Aroclor-1260 for Ingestion (Dairy) should be $9.6x10^{-5}$ instead of the value listed.
Response: Agreed
Action: Values have been increased in Section I.11 (Table I.11-4, p. I-11-8).

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: I-12 Pg. #: I-12-3 Line #: 1 Code: C
Original Comment # 99
Comment: "...accounts for **more than approximately** 99 percent..." sounds more accurate than the way it is currently written.
Response: Agreed.
Action: Text has been changed in Section I.12.

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: I-13 Pg. #: I-13-50 Line #: 27 Code: C
Original Comment # 100
Comment: ATSDAR should be ATSDR.
Response: Comment noted.
Action: Text has been revised in Section I.13.

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: Attachment IV Pg. #: Line #: Code: M
Original Comment # 101
Comment: With the exceptions listed below, the risk calculations appear correct (based on hand-calculation of the exposures and risks associated with each of the major COCs).

Pathway	Specific References	Comments
Dermal Contact (Soil)	Tables I.IV-6 I.IV-12, I.IV-39 I.IV-74, I.IV-78	Comments on methodology/presentation: (1) Need to list a reference for chemical specific absorption factors (ABS). It is evident that most of the listed values are directly used from USEPA (1992) Dermal Guidance and chemicals for which no ABS was available were analyzed by analogy to similar chemicals; however, this methodology needs to be explained in the toxicity profiles if not elsewhere in the text and footnoted and/or referenced in these tables. (2) It is unclear how the ABS values for Cu, Ni, and V were derived - and no reference is given.

Response: The references in Table I.8-2 for dermal, chemical specific absorption factors (ABS) will be reviewed and clarified as needed.
Action: The table has been modified as necessary.

For the expanded trespasser for current land use, the value for the two CDI calculations for beryllium appears to be about 0.9 higher than hand-calculated values.

Response: These calculations will be checked during the revision of the CRARE.
Action: The text has been modified as necessary.

Editorial Comments: The headings of the Chemical Concentration tables are being truncated (i.e., **Concentrati...**).

Response: The headings will be corrected.
Action: The text has been modified as necessary.

Ingestion (Dairy)	Tables I.IV-79 and I.IV-93	Check the discrepancy between these two tables for the concentrations (and subsequent exposure and risk calculations) of U-238.

Response: The values will be checked.
Action: The text has been modified as necessary.

Ingestion	Tables I.IV-81 and I.IV-95	Check the discrepancy between these two tables for the concentrations (and subsequent exposure and risk calculations) of U-238.

Response: The values will be checked.
Action: The text has been modified as necessary.

PROPOSED PLAN Comments

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: Proposed Plan Pg.#: 4-6 Line #: Table 4-2 Code: E
Original Comment # 102
Comment: Change "carconogenic" to "carcinogenic"
Response: Agreed.
Action: Table 4-2 has been revised to correct the spelling error.

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: Section 5 of PP Pg.#: Line #: Code: C
Original Comment # 103
Comment: The PP is a concise presentation of site conditions, risk assessment findings, and FS results. As a stand-alone document, it would be improved if a few figures were included to depict the locations ("footprints") of the major alternative remedial features such as: areas to be excavated, the on-site disposal cell, the Solid Waste Landfill cap, the Lime Sludge Pond cap, and the Consolidation-Containment cell, cap, and interceptor trench drain.
Response: Agreed.
Action: The following figures have been added to Section 5.0 of the Proposed Plan: typical section of a subsurface drain; composite cap and liner; proposed location of on-site disposal facility.

Commenting Organization: Ohio EPA Commentor: GeoTrans
Section #: PP,Sec.5.4 Pg.#: Line #: Code: C
Original Comment # 104
Comment: Please define what is meant by "Quantities of waste" in the bulleted items to remove ambiguity.
Response: "Quantities of waste" is referring to the amount of waste that will be excavated for treatment and/or disposal.
Action: The use of the category "quantities of waste" has been clarified in the introduction to Section 5.4 by expanding the term to say "the quantities of waste to be handled."